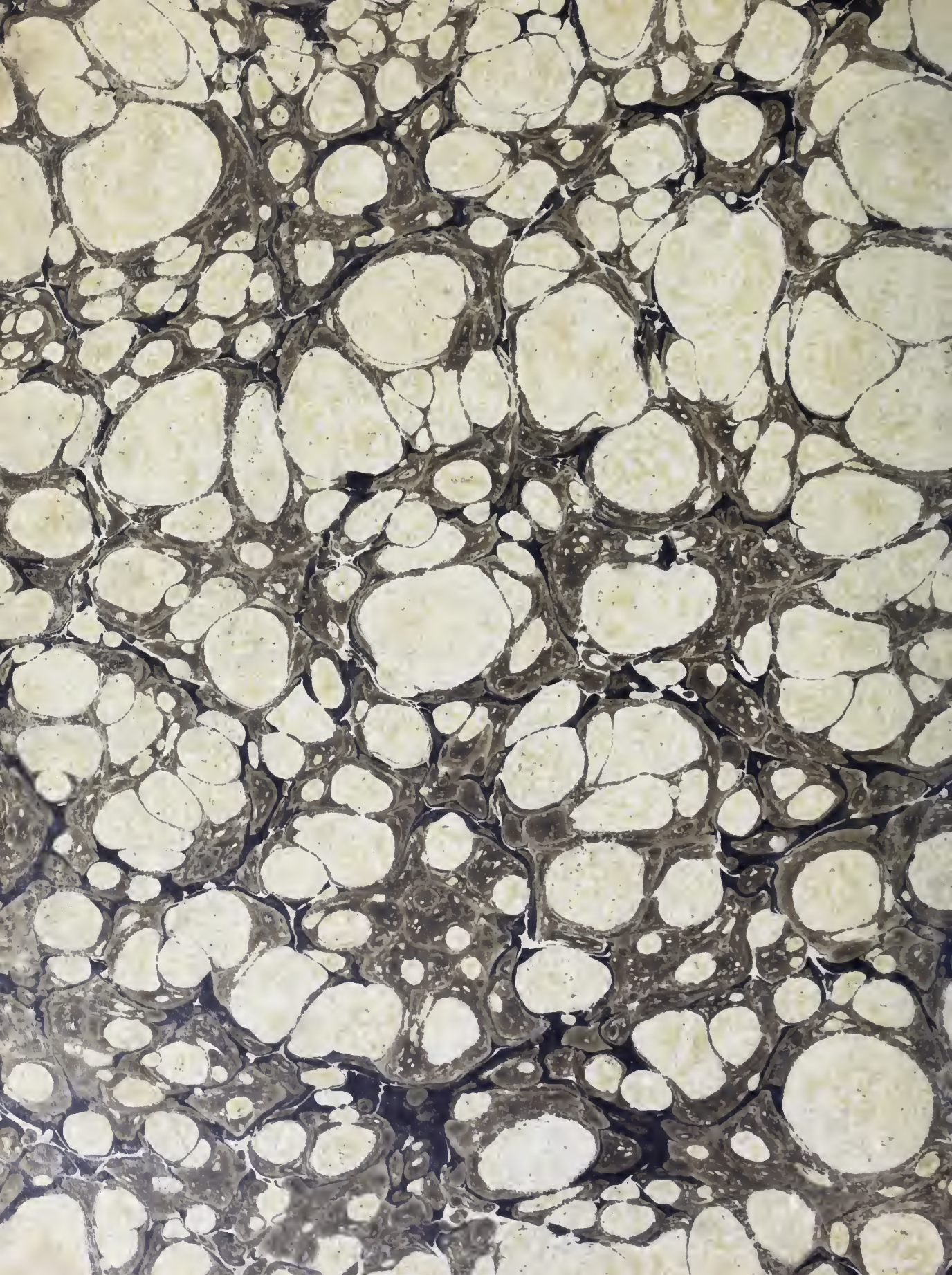
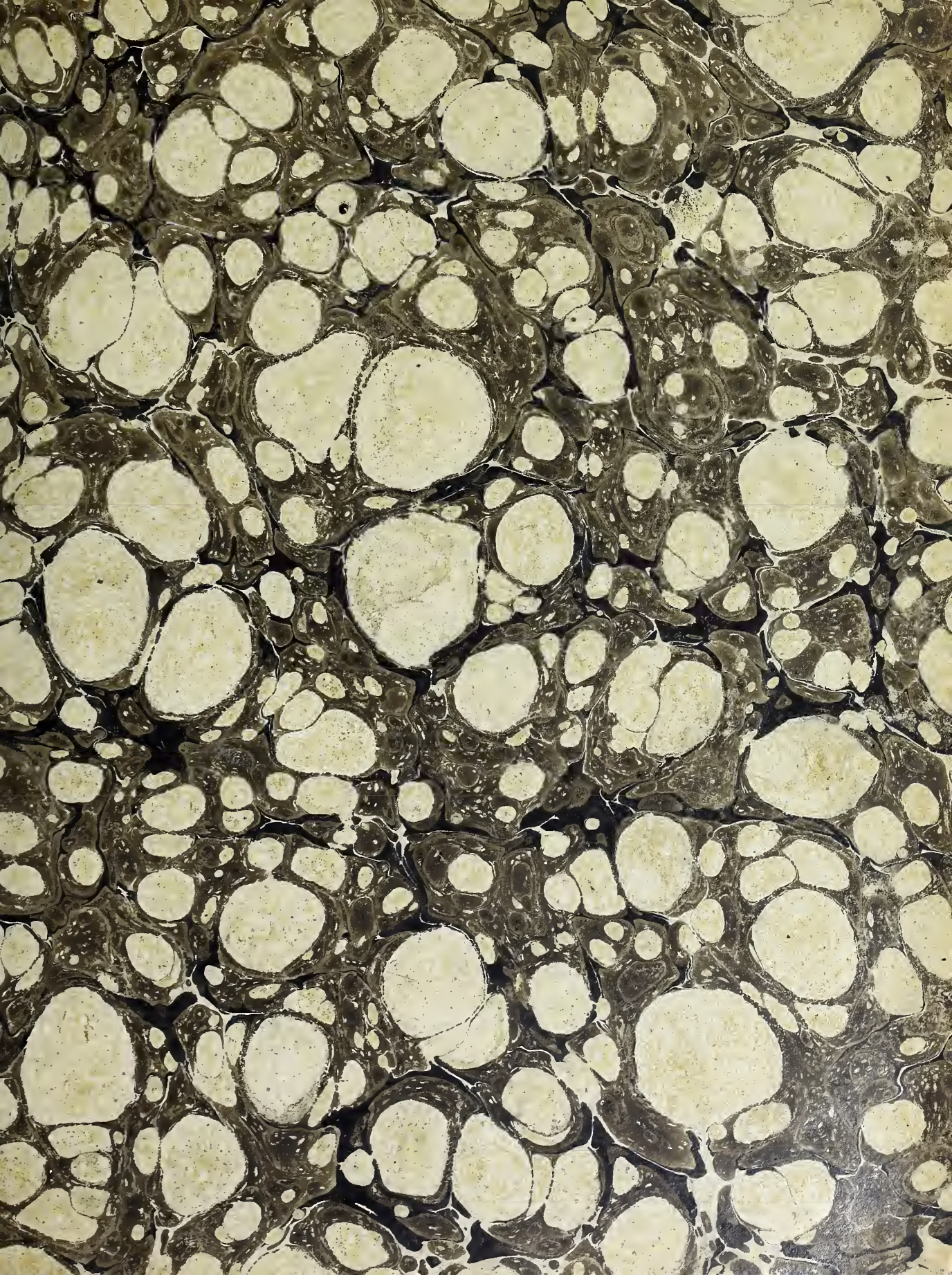
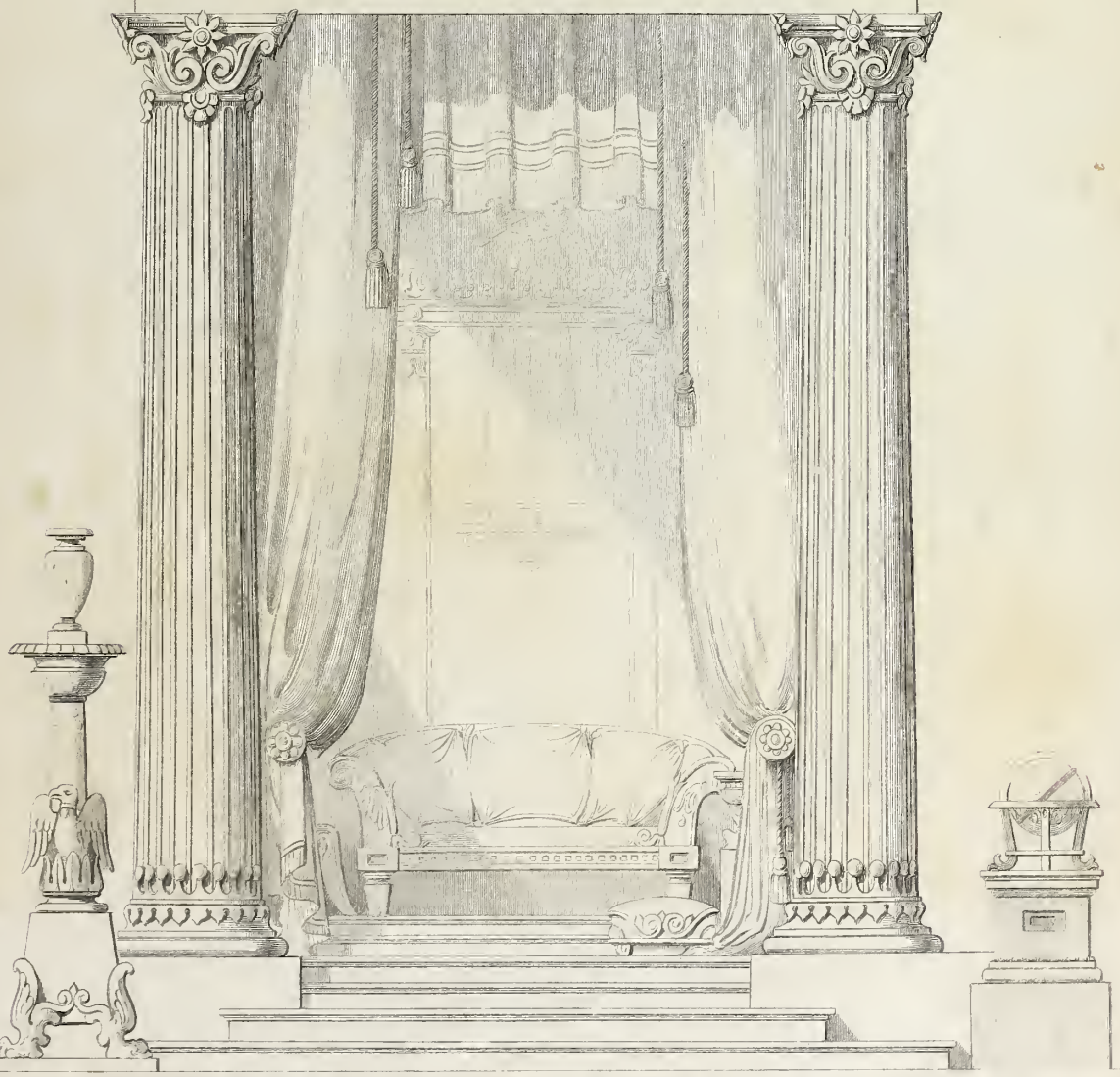




OCTANGULAR TENT ROOM.

SMITH'S CABINET-MAKER'S & UPHOLSTERER'S GUIDE, DRAWING BOOK,

AND REPOSITORY OF



ORIGINAL DESIGNS FOR HOUSEHOLD FURNITURE AND INTERIOR DECORATION
IN THE MOST APPROVED AND MODERN TASTE;
INCLUDING SPECIMENS OF THE EGYPTIAN, GREEK OR CLASSIC, ARABESQUE AND GOTHIC
ORDER, SCHOOL OF ART, &C.
FOR CABINET MAKERS
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THE

CABINET-MAKER AND UPHOLSTERER'S

GUIDE:

BEING A

COMPLETE DRAWING BOOK;

IN WHICH WILL BE COMPRISED

TREATISES

ON

GEOMETRY AND PERSPECTIVE,

AS APPLICABLE TO THE ABOVE BRANCHES OF MECHANICS;

The Definitions and Problems explained in the most plain and familiar Terms, with much new matter introduced, and the Diagrams rendered at once entertaining and practically useful. The whole Illustrated by a Series of Instructive Examples, and

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TO WHICH IS ADDED, A

COMPLETE SERIES OF NEW AND ORIGINAL DESIGNS

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In the most approved, elegant, and modern Taste,

BEAUTIFULLY AND CORRECTLY COLOURED,

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And accompanied with Useful and Practical Instructions for the Manufacture of the same.

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COMPRISING LIKEWISE,

INSTRUCTIONS AND EXAMPLES IN THE ELEMENTARY PRINCIPLES

OF

ORNAMENTAL FOLIAGE, &c.

Enabling the Student to draw with facility and correctness in this so generally useful branch of the Art; with numerous Original Compositions, adapted for Tablets, Friezes, &c. for the use of Carvers—Painters—Modellers—Masons—Smiths, &c. and all the various workers in Metals, &c.

By GEORGE SMITH,

Upholsterer and Furniture Draughtsman to HIS MAJESTY; *Principal of the Drawing Academy, Brewer Street, Golden Square; and Author of various Works on the Arts of Design and Decoration.*

LONDON:

PUBLISHED BY JONES AND CO.

ACTON PLACE, KINGSLAND ROAD.

1826.

INTRODUCTION.

Historical View of the Origin of the Art in this Country.—First Specimens introduced by the Norman Invasion.—Ornaments derived from Cathedrals and Ancient Edifices.—Mr. Cotman's Work.—Reign of Richard II.—The Norman and Saxon Style superseded by the florid Gothic during the Reigns of Henry I, II, and III.—Distinguishing Feature of the Taste from this period to the Reign of Elizabeth.—Progressive Improvement continued.—Age of Louis XIV.—The old system superseded by the Arabesque Style.—Importation into England.—Continued to the early part of George III.—Messrs. Chippendale's and Ince's Works.—A total revolution in Taste, introduced by the Messrs. Adams.—Improved by Mr. James Wyatt.—Perfection in Ornament, &c. reserved for the present time.—Effect produced by Mons. Denon's Work.—The Author's first Work on Furniture and Design superseded by later Improvements.—By what Cause Produced—Intended Object and Plan of the Present Work.

IN a work treating wholly of Domestic English Furniture, it can scarcely be considered irrelevant, to precede it with a short historical view of the earliest style, variations, and progressive improvements that have taken place up to the present period.

As far as research so remote, can enable us to form any judgment on this subject, the Norman invasion of our island appears to have afforded the earliest specimens of what constituted the Domestic Furniture of that warlike age.

It is probable that in proportion as their manners were simple, and luxury was unknown, their Domestic Furniture would comprise utility, divested of ostentation. No doubt the conqueror and his nobles brought with them the taste of their country; for in the very few specimens that time has spared of the style of that age, we can only distinguish the bold projecting mouldings on the legs supporting their tables and seats, and wherever ornament was adopted, it appears to have corresponded with those used in their cathedrals; examples of which may be seen in Mr. Cotman's accurate drawings, made from the ancient edifices, and from which it is evident that their artists were not unacquainted with the Grecian elegance of composition.

From this period to the reign of Richard II, the Baronial castle alone offers any example of domestic furniture. The same simple style seems to have been followed, but with the addition of more enrichment.—During the reigns of the three first Henrys, the Norman and Saxon architecture gave place to the pointed and florid Gothic, changing in a great degree the feature of domestic furniture. The taste of these times down to the reign of Elizabeth, is distinguishable in the light spiral columns in the backs of chairs, the spiral twisted column in the legs of their tables, the variety and beauty of their turned mouldings, and in an excessive use of ornament, no way to be compared in excellence with what preceded.

From this period, and during the fifteenth and sixteenth centuries, under Louis XII, and Francis I, of France, at which time some distinguished artists existed, and until the age of Louis

XIV, the taste in decoration appears to have progressively improved. At this period, the whole system seems to have given place to a style completely Arabesque, although blended with much grandeur peculiar to this taste, and brought to great perfection by the artists then employed in its manufacture.—The importation of it into England, changed the whole feature of design, as it related to household furniture, in our houses and mansions. This taste continued almost unchanged through the reign of George II, and the earlier part of George III. The elder Mr. Chippendale, was, I believe, the first author who favored the public with a work consisting of designs drawn from this school, with great merit to himself, however defective the taste of the time might be. To this work succeeded that of Mr. Ince, in the same style. From this period to the time of Messrs. R. and J. Adams, the same species of design continued, with little or no alteration, until the researches of these scientific Gentlemen in architecture and ornament, in Rome, Dalmatia, and other parts of Italy and Greece, were made public. A complete revolution in the taste of design immediately followed; the heavy pannelled wall, the deeply coffered ceiling, although they offered an imposing and grand effect, gave way to the introduction of a light Arabesque style, and an ornament highly beautiful. But the period for the introduction of not only a chaste style in architecture, but likewise of ornament (and which extended itself to our domestic moveables), was reserved for the late Mr. James Wyatt, whose classic designs will carry his name to posterity with unimpaired approbation. Here it would appear almost unnecessary for invention to have gone further, but

perfection, it appears, was reserved for the present period, in relation to ornament and domestic embellishment. In the year 1804, Mons. Denons' grand publication, detailing the antiquities of Egypt, became public. The novelty displayed throughout these fine specimens of art, calling to recollection so distant a portion of ancient history, gave rise and life to a taste for this description of embellishment. At this period, the author was induced to lay before the public, a Collection of Designs for Domestic Furniture. This work, however highly appreciated at the time, has become wholly obsolete and inapplicable to its intended purpose, by the change of taste and rapid improvements which a period of twenty years has introduced. The travels of scientific men—the publications within the last twenty years—the Elgin marbles, all alike detailing the perfection of Grecian architecture and ornament; the beautiful specimens contained in Sir William Gell's work on the Remains of Pompeii—the inexhaustible resources for beautiful outline in the Vases of Sir William Hamilton, if no other causes had existed, would surely have been sufficient to account for the present elegant and refined taste. In this highly improved state of the fine arts, a work on domestic furniture, comprehending every improvement to the present day, may be considered necessary as well as acceptable to the trade, and has induced the author to compile this volume, containing, not only A LARGE COLLECTION of ORIGINAL DESIGNS, in the various schools of the art, but also to add to it instructions in drawing, sufficient to make any one a draftsman in his own person. For this purpose, a portion of **GEOMETRY** is of the greatest

consequence, and scarcely to be dispensed with; the knowledge it gives of the power of lines is without limit, and the assistance it affords in the practice of Perspective, great and extensive.—**PERSPECTIVE DRAWING** is of equal use to every one, who would wish to place the object of his invention under the most intelligible and natural position before a spectator, and renders a treatise on it a necessary appendage to such a publication.

Some works on domestic embellishment have lately been published, wholly in outline; this kind of design may answer extremely well for the architect, but is of little use to those who cannot readily make out all the projecting parts from a plan; this, perspective will accomplish, and a design made out under its rules, will not only give a natural and pleasing representation of any object, but convey all its projecting and receding parts with clearness to the observer. **ORNAMENTAL DRAWING** is likewise an acquirement every Artisan ought more or less to be acquainted with, and is of peculiar advantage to the Cabinet-Maker and Upholsterer, in the embellishment of his designs. Instructions, therefore, in this elegant branch of Art, should form a component part of the **DRAWING BOOK**, so as to become of general use.

With an experience of forty years devoted to the study of these subjects, both in theory and practical application; and having been honored with the patronage of **HIS PRESENT MAJESTY**, as well as the most flattering testimonies from *Mr. Thomas Hope*, and other individuals, distinguished by their researches, and liberal patronage of the Arts; the Author trusts he may without presumption, promise to produce

a Work at once creditable to his own labours, and combining whatever is of real utility to those connected with the Cabinet-making and Upholstery trade—a work, in short, the most complete in itself, and superior to any that has hitherto appeared on the same subject.

Our vessel now launched, may she encounter prosperous gales during her voyage over the extensive tract she is destined to sail; and that her freight may prove extensively useful, as well as beneficial, is the sincere wish of the author,

GEORGE SMITH.

41, *Brewer Street,*
Golden Square, London,
April 8, 1826.

THE

CABINET-MAKER AND UPHOLSTERER'S

GUIDE,

&c. &c.

GEOMETRY,

Should commence with the definition of terms, and first with that of points, proceeding next to define the nature of lines, angles, surfaces and solids.

I cannot agree with some authors who conclude Euclid's definition of the point to be useless, inasmuch as the thing in itself is self-evident.

There are many reasons for adopting a different opinion; first, a series of points constitute a line, a series of lines produce a surface, and a series of surfaces generate a solid.

There are in perspective, points of intersection, points horizontal, station points, points of distance, and vanishing points, &c. each requiring explanation to render them familiar to the mind, as they pass under consideration in practice.

A POINT, is that which is without parts or magnitude—is the least part of matter, and thus called a physical point.

For example:—such is the point made by the compasses, pencil or ink, as the point A, in GEOMETRY, PLATE 1. a series of points put together, in length form right or curved lines, such are the lines figured 4*x*, 5*x*.

A line of points *a b*, fig. 6, supposed to move from *a* towards *c*, will in its course downwards, generate a plane *a b c d*.

The mathematical point, is the least object possible to be conveyed to the imagination, and consequently invisible; it is without dimension, but is the beginning of every invisible length.

Given point, is a point proposed to be set in some place, whether denoted by compasses or pin. For example: the point B, fig. *a a*, is a point given, for this reason, that on that spot is placed a pivot.

Point of intersection, is a point where many lines cross or meet each other. For example: the point G, fig. 1, is the point of intersection, because the walls H G D, E F C, meet together at the point G.

Horizontal points, are points equally distant from the centre of the earth; such are the points *h h h*, fig. 2, and a series of such points constitute the entire surface of the globe. N.B. Their use will be explained in describing the horizon in perspective.

Point of incidence, is a point where one line meets or touches another line or superfice, and there makes an angle. Example: the point I, in fig. I A, is the point of incidence, because it is the point where the right line K I, meeting the right line L M, makes there an angle.

Point of contact, is where a right line touches a curved line, in such manner, that being produced or extended it will not cut the curve, or it is a point where two curved lines meet together without cutting. Example: the point N, fig. 2, is the point of contact; because it is the place where the right line O N touches the curve, and being prolonged or extended to P, it does not cut the curved line N Q R; for the same reason the point Q is the point of contact.

Station point, is a point where we would place a staff, or the foot of any mathematical instrument in surveying. Example: the point T, fig. 3, is a station point; because it is the place on which we would put the instrument O. N.B. this also will be further explained in the perspective.

Point of distance, or extent, is a point or any other mark observable in some part of an object to be measured. Example: the crossed arrows in the building at V, fig. 3, serve as a point of distance; because the mark, or point V, is one of the points necessary towards enabling us to ascertain the inaccessible height, X W.

LINES.

A line, is a length without breath.

The mathematical or intellectual line, is that which we imagine to pass from one object to another without being visible. Example: the line A B,

GEOMETRY I.

DEFINITIONS.

OF POINTS.

Fig 1.

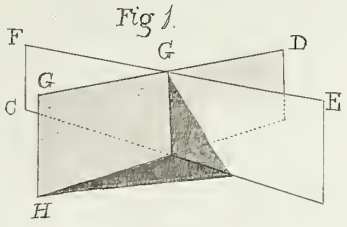
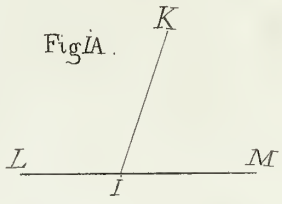


Fig 1A.



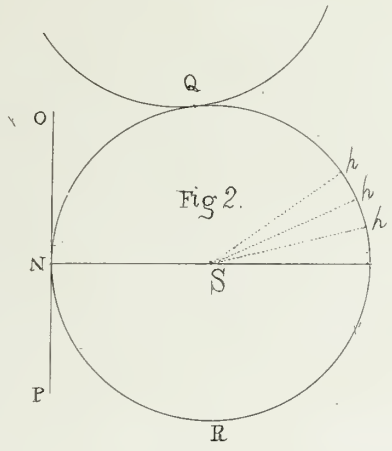


Fig 2.

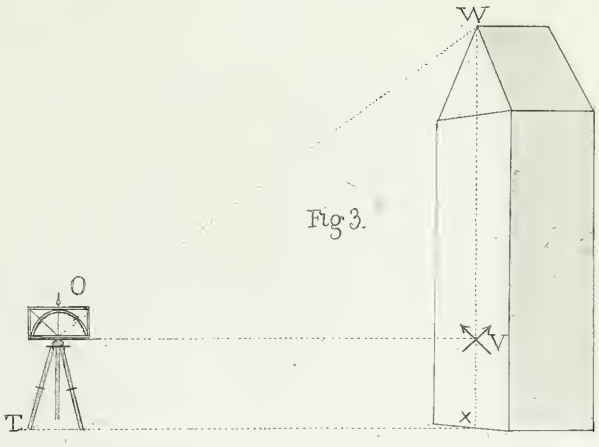


Fig 3.

Fig 4. ×

Fig 5. ×

Fig 6.

OF LINES.

Fig 1.

A ——— B

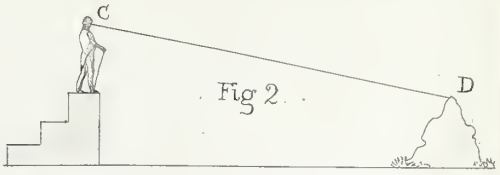


Fig 2.

Fig 3.

E ——— F

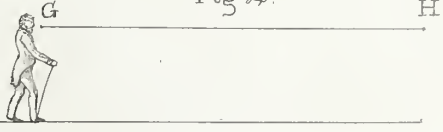


Fig 4.

Fig 5.

I ——— K

N

Fig 6.

L ——— M

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fig. 1, or the line C D, fig. 2, are each mathematical lines; because supposed to be invisible.

The physical or visible line, is that made by the motion of a physical point, and which is drawn with the ink, pencil or any other material. Example: the line E F, fig. 3, is a physical or material line; because it is made by something rendering it visible.

A right line, is that which is equally comprised between its extreme points. Example: the line G H, fig. 4, is a right line, because its points are equally disposed betwixt the extremities G and H, neither rising nor descending one more than another; so that if we view this line G H, from its extreme as at G, that first point G, shall cover all the other points which we suppose to be contained from G to H, for generating the right line G H. Remark, that a right line is the shortest distance betwixt one point and another.

The extremities of lines are points. Example: the extremities of the line N, fig. 5, are the points I K.

Indefinite or indeterminate line, is a line drawn of any length we choose, being at liberty to make it more or less extended. Example: the line L M, fig. 6, is an indefinite line, because it is supposed not to be determined, being at liberty to make it longer or shorter at pleasure.

The definite or given line, is that contained in a certain length. Example: the line O P, fig. 7, GEOMETRY, PLATE 2, is a determinate line, because its limits are from O to P.

Perpendicular line, is a right line, which falling on another right line, makes the angles on each side equal. Example: the line Q R, fig. 8, is perpendicular upon the line S T, because falling on the line S T, it makes the angles R Q S, R Q T, both equal to right angles; for the same reason the pillar A, fig. A, is said to be placed perpendicular or plumb to the horizon or ground B, because it makes right angles with the horizon; remark also, that a line charged with a plummet at one of its extremities, as at N, fig. N, makes a perpendicular line, called by workmen a plumb line.

Inclined line, is that which, falling on another line or on some plane, is neither perpendicular nor horizontal to the line or plane on which it falls; but is slopwise. Example: the line V U, fig. M, is inclined in respect to the line W X.

Parallel right lines, are such as being in the same plane, and drawn apart the one from the other indefinitely, will never meet. Example: the right lines *a b*, *c d*, *e f*, fig. 9, are parallel lines, because, being in the same plane and drawn apart, they will never meet or cut each other. Lines are in general called parallel lines, or simply parallels, being such as are equally distant from each other in their extent: thus the curved lines *g h*, *i k*, fig. 10, are called parallels, because the smaller curved line *i k*, is equally distant in its course with the longer line *g h*.

Ordinate lines, are lines parallel to another line serving as a base to a parabolic figure. Example: the lines *o o*, *y z*, *w x*, *v u*, *s t*, fig. 11, are called ordinate lines, for this reason, that they are parallel to the line P Q, the base of the parabola P Q R.

Horizontal Line, called likewise the line of apparent level, is that which touches or cuts at right angles, a line tending to the earth's centre. Example: The line N, N, fig. 12, is an horizontal line, because it cuts at right angles the line C D, tending to the earth's centre at D, and all lines which are parallel to the line N N, such as M M, L L, in the same figure, are called horizontal lines.

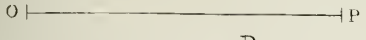
Level Line, is that which is drawn horizontally, by an instrument called the level. Example: the line Q R, fig. 13, is termed a level line, inasmuch as it is level with the horizon, being drawn along the lengthened side, S T of the level V, adjusted horizontally by the plumb line U.

Diagonal Line, or simply a diagonal, is a right line, which being drawn in a square or parallelogram, from one angle to the opposite, divides them into two equal parts. Example: in the square W, X, Z, Y, fig. 14, the line W Y is a diagonal, because it passes from the angle X, W, Z, to the opposite angle X, Y, Z, and divides the square W, X, Y, Z, into two parts, or equal triangles, W, X, Y, and W, Z, Y. The same applies to the parallelogram W, X, Y, Z in the same figure.

Line of sight or visual ray, is a line formed by the eye in viewing an object, either by means of stakes, the quadrant, or other instruments. For example: the line N B, GEOMETRY, PLATE 3, in fig. 15, is the line of sight or visual ray, because it is formed by the eye in viewing the object C, through the telescope D.

N. B. This line is of great use in perspective.

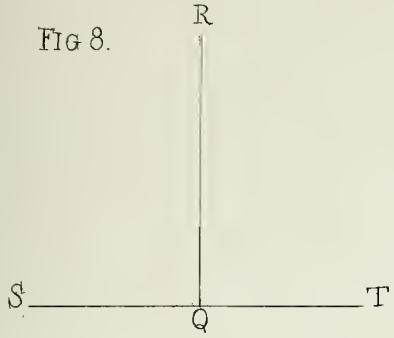
FIG. 7.



GEOMETRY II.

DEFINITIONS OF LINES.

FIG 8.



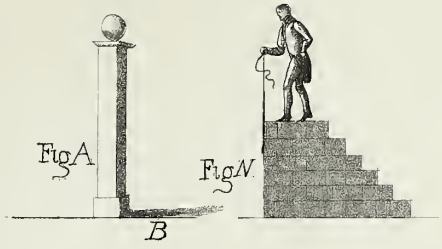


FIG M.

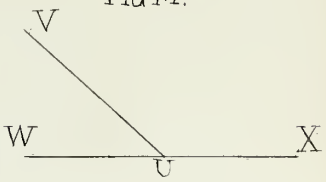


FIG 9.

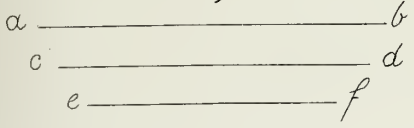


FIG 10.

FIG 11.

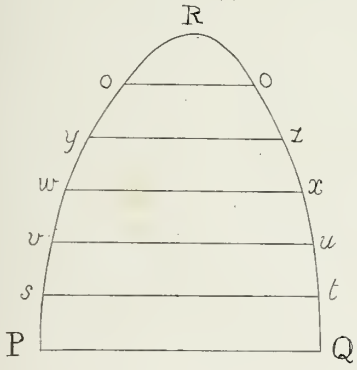


FIG 12.

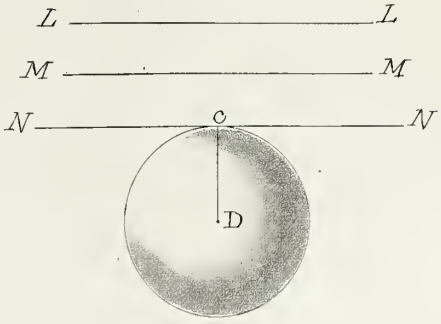


FIG 13.

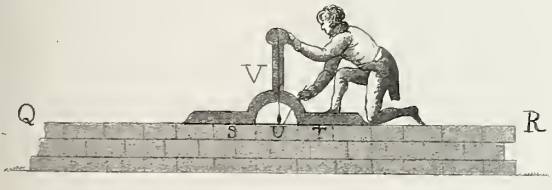
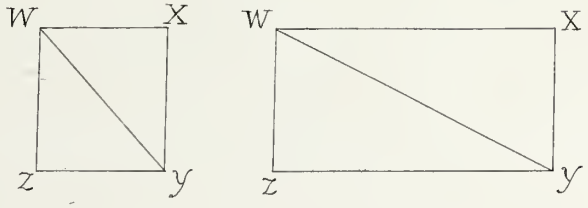


FIG 14.



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GEOMETRY III

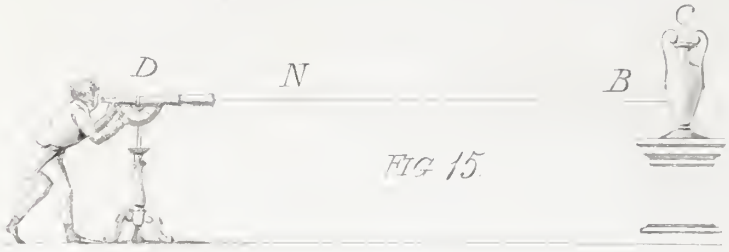


FIG 15.

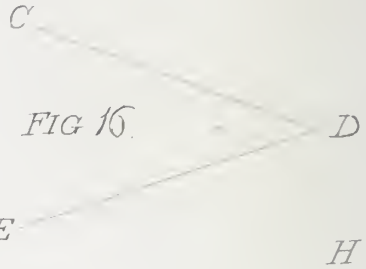


FIG 16.

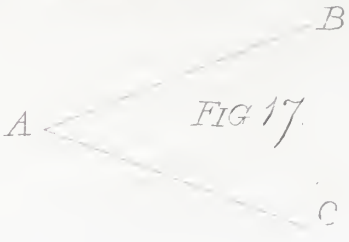


FIG 17.

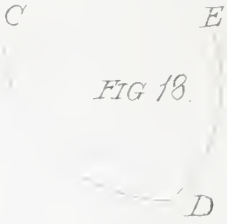


FIG 18.

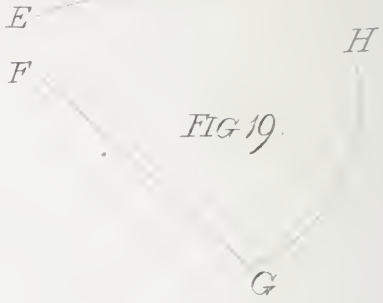


FIG 19.

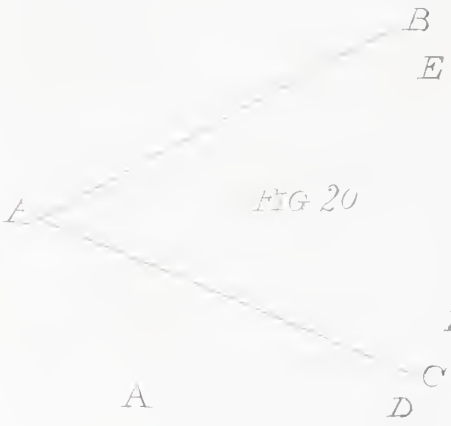


FIG 20.

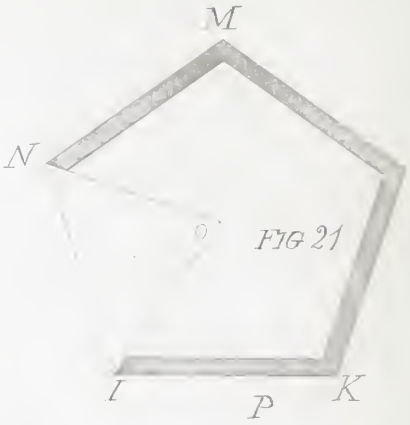


FIG 21.

FIG 24.

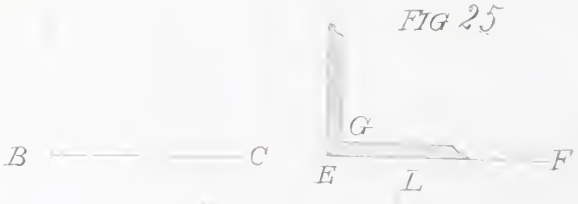


FIG 25.

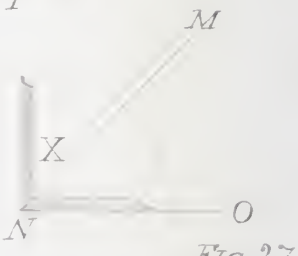


FIG 27.

FIG 25.

ANGLES.

A plain angle, is the inclination of two lines, the one towards the other, and indirectly touching in a plane or surface. Example: the two lines, C D, E D, fig. 16, PLATE 3, form an angle C D E, because the two lines, C D, E D, touch indirectly at the point D; that is to say, the two lines which are drawn on the same plane do not form one right line, and therefore form the angle C D E. Remark, that the middle letter in all triangles expresses the angle; D therefore is the angle formed by the two lines C D, and D E, likewise the angle of any figure is generally expressed by a single letter, as D.

Right lined angle.—The angle, A, B, C, fig. 17, is a right lined angle, because it is formed by the two right lines, A B, A C.

Curvilineal angle, is an angle formed by two curved lines. Example: the angle C D E, fig. 18, is curvilineal, because it is formed by the two curved lines, C D, E D.

Mixtilineal angle, is an angle formed by a curved and a straight line. Thus: the angle F G H, fig. 19, is a mixed angle, being formed by the straight line, F G and the curved line H G.

N. B. The lines forming any angle are called its legs.

An angle is said to be less than another, when its legs are more inclined to, or nearer each other; let there be two lines, A B, A C, fig. 20, meeting in the point A. Now if you imagine the legs A B, A C, to be moveable on a joint at A, it is easy to comprehend that the further they are opened or parted from each other, the greater will be the angle between them; and, on the contrary, the nearer they are brought together, the more they will incline to each other, and so the angle betwixt them will be less, as D E.

The angle of a polygon, or figure of many angles, is that formed by any two sides of the figure. Example: the angle, K, fig. 21, is the angle of a polygon, because it is made by the two sides I K, K L, of the pentagon, I K L M N.

External angle, is that angle which has its point without the figure. Example: the angle, N M L, fig. 21, is an external angle, because its point is without the figure, I K L M N.

Internal angle, is that which carries its point within the figure, such as the angle N O I, in the pentagon I K L M N, fig. 21.

All angles are measured by an arc of a circle, containing a certain number of divisions or degrees of the whole circle. In order to have a clear idea of which, we shall proceed to lay down the divisions, as settled by geometers, in dividing the circle's circumference, and at the same time furnish instructions for making such divisions, before we commence describing figures of many angles.

The circle by all geometers is divided into 360 parts, otherwise termed degrees. Thus the circumference of the circle, A B C D E F G H, fig. 22, PLATE 4, is supposed to be divided into such a number of parts or degrees. It is evident the divisions will be less in a small circle than in one more extended. Thus the circle, *a b c d e f g h*, though smaller, contains the same number of degrees as the larger circle, in consequence of both generating from the same central point S.

The line A B, dividing the circle into two equal parts, the arc A B C will necessarily contain 180 degrees, the half of 360, and is called a semicircle. The line C D, perpendicular to A B, and passing through the circle's centre at D, will divide it into four equal parts, of 90 degrees each, four times ninety making the whole number 360. If the arcs A C, C B, B D, D A, are subdivided at E, G, H, and F, the circle will then be divided into eight equal parts, of forty-five degrees each; eight times forty-five, making the whole number 360, as before.

The semicircle, A B C, fig. 23, PLATE 4, represents the protractor in a Case of Instruments, (of the whole of which, with the latest improvements, and their proper uses, a description will be given in course of the work), the outermost line A B C, being gradated from A to C, into 180 equal parts or degrees. The angle A I D, is found to contain forty-five of these degrees, and is the side of an octagon. The angle E I F, is found to contain sixty degrees, and is hence the side of a sexagon. The angle G I H, is found to contain seventy-two degrees, and is therefore the side of a pentagon. The angle A I B, contains ninety degrees, and becomes the side of a square. The angle K I L, contains 120 degrees, and furnishes the side of a triangle, and thus may be laid down the angle of any figure, from ten degrees and upwards, to within one degree of 180, when it becomes a straight line.

GEOMETRY
IV.

Division of the circle.

Fig. 22.

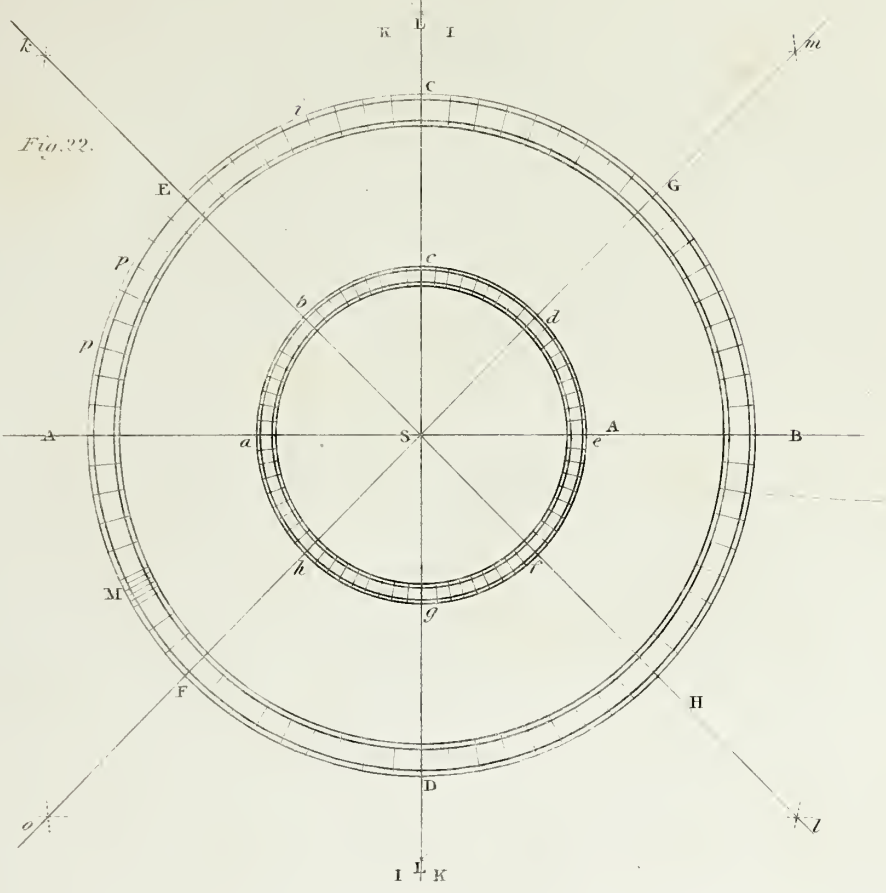
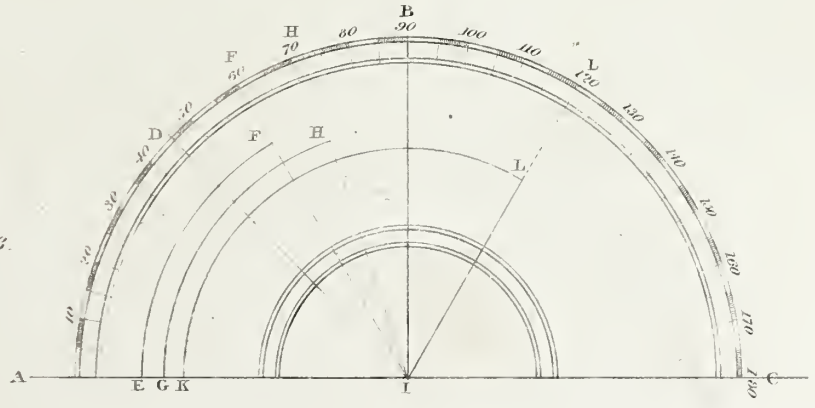


Fig. 23.



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To divide the circle into 360 *parts or degrees.*

Let the line A B, fig. 22, PLATE 4, be the proposed diameter of the circle, to be divided into two equal parts at S, and describe the circle A C B D, on A, with any opening of your compasses, greater than A S, as A A. Describe two arcs at I I, then on B. With the same opening of the compasses, describe two other arcs K K, cutting the arcs I I at L L; through their intersection, draw the line C D, which passing through the centre S, will be perpendicular to A B, and the circle will then be divided into four equal parts; on A and C, with any radius A *i*, more than half A C, describe two arcs, cutting each other at *k;* and draw the line *k* S, indefinite to *l;* on B and C, describe two other arcs with the same radius, cutting each other at *m*, and draw *m* S, indefinite to *o*, which will then subdivide the arcs A C at E, C B at G, B D at H, and D A at F. The circle by this process becomes divided into eight equal parts. Next proceed and divide any one of these eight parts, as A E, into three equal parts at *p p*, and these three parts again into three other equal parts, and you then have nine divisions in an eighth part of the circle: divide the remaining parts into the same proportions, there will then be 72 divisions round the circle, of five degrees each, equal in the whole to 360. To obtain the degrees, divide any one part, as M, into five parts, and each other part into a like division; the whole circle will then be divided into 360 equal parts or degrees.

The use of the circle so divided, is to enable the student to lay down an angle of any number of degrees he may require, whether for the triangle, pentagon, sexagon, octagon, or any other figure of many sides.

A right angle, is that which is made by a right line, falling perpendicularly on another, or which contains in its opening the fourth part of the circumference of a circle, described from its point, or which contains 90 degrees out of 360, the circle's whole circumference.

Example: the angle A B C, fig. 24, PLATE 3, is a right angle, because the line A B, falls perpendicular on B C, at the point B; or because the angle contains in its opening the fourth part of a circle, described from the point B of the angle A B C.

Remark, the right angle is ordinarily called by workmen a square angle.

for instance; the angle D E F, fig. 25, is a square angle, because it is made by means of the square G.

An obtuse angle is greater than a right angle, or that which contains more in its opening than a quarter of a circle. Example: the angle H I K, fig. 26, is obtuse, because it exceeds the right angle, L I K, or because it contains in its opening more than 90 degrees, or more than a quarter of the circumference of a circle, described from the point I of the angle H I K. Workmen call the obtuse angle, a full angle, because it is more open than the square angle V.

An acute angle is less than a right angle, or that which contains betwixt its lines less than the quarter of a circle, or less than ninety degrees. The angle M N O, fig. 27, is acute, because it is less than the right angle P N O, as it contains between its two legs, less than 90 degrees, or a quarter of the circumference of the circle described from its point N: the acute angle is termed by workmen, a lean angle, because it is less than the square angle X.

TRIANGLES.

A triangle, is a plain figure bounded by three lines, and containing as many angles. Example: the triangle A B C, fig. 28, PLATE 5, is a plain triangle, because it is bounded by the lines A B, B C, and C A.

The triangle A B C, is likewise called a right lined triangle, because its lines are all right or strait.

Mixed triangle is that which has two of its sides curved, or sometimes only one, such are E and F, fig. 29 and 30.

Equilateral triangle, is that which has its three sides equal; thus G, fig. 31, is an equilateral triangle, because its three sides H I K, are all equal.

A right angled triangle, is that which has one right angle. The triangle L M N, fig. 32, is a right angled triangle, because M is a right angle of 90 degrees.

Observe that in all right angled triangles, the line opposite the right angle, is called its hypothenuse; the line L N, is the hypothenuse of the right angled triangle L M N.

Scalene triangle, fig. 33, is one which has its three sides unequal; the

GEOMETRY. V.

Fig. 28.

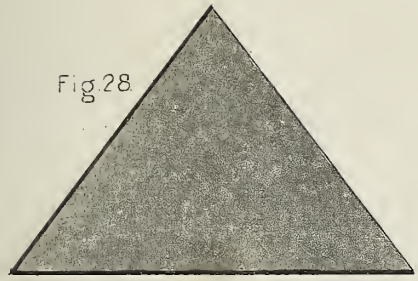


Fig. 29.

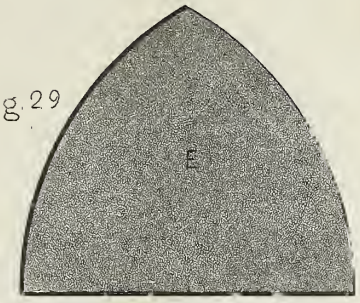


Fig. 30.

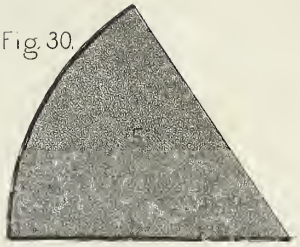


Fig. 31.

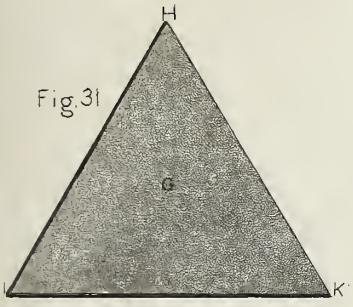


Fig. 32.

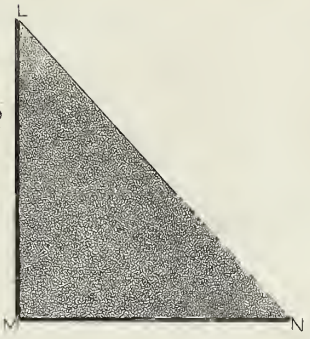


Fig. 33.

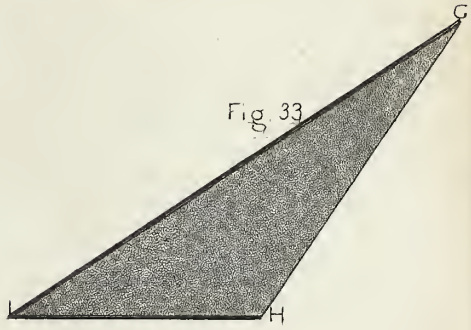


Fig. 34.

Fig. 35.

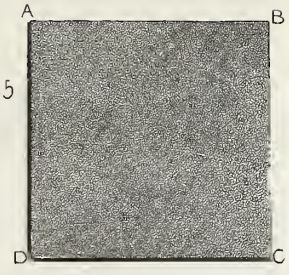


Fig. 36.

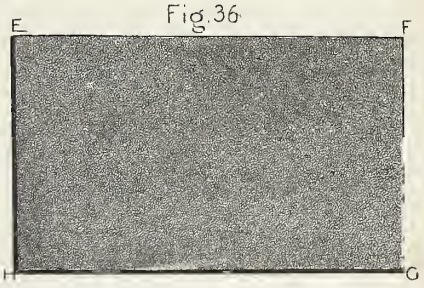


Fig. 37.

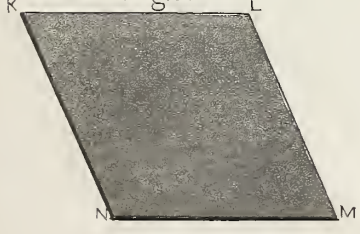
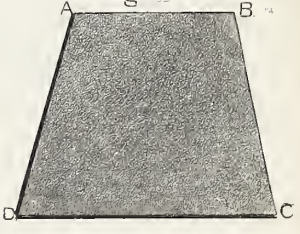


Fig. 38.

Fig. 39.



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triangle G H I, fig. 33, is a scalene triangle, because its three sides are of different lengths, the side G I, being longer than that of G H, and the side G H longer than H I.

Isoscele triangle, is that which has only two sides equal. The triangle D E F, fig. 34, is an isoscele triangle, because the two sides D F and D E, are of the same length; but it is possible for the side F E to be longer than either of the two sides D F, D E.

FIGURES.

A square, is a figure in which the four sides are equal, and the four angles are right angles. The square A B C D, fig. 35, is termed a perfect square, because its four sides are equal, and the four angles equal. The square likewise, in practical geometry, is termed equilateral square, right angled square, and parallelogram, because it has its four sides equal or of the same length, its four angles are right angles, and its opposite sides parallel.

The long square, has its four angles right angles, but all its sides are not equal. E F G H, fig. 36, is a long square, because its four angles are right angles, and its four sides are not equal, having two sides longer than the other two; this long square is sometimes called oblong square, right angled parallelogram, or simply rectangle.

Rhomb, is a figure, having four equal sides, but not equal angles; K L M N, fig. 37, is a rhomb, for the reason that the four sides are equal, and because its four angles are unequal, having the two angles K L M and K N M obtuse, and the other two opposite angles N K L and N M L acute.

The Rhomb, is sometimes termed lozenge, and sometimes equilateral Rhomb.

Rhomboid, is a figure which has its angles, as likewise its opposite sides, equal betwixt themselves, being neither equilateral nor rectangular. O P Q R, fig. 38, is a Rhomboid, because its two opposite sides, O P Q R, which are parallels, are longer than the other two sides P Q, O R, which are equal and parallel betwixt themselves, and the four angles are not right angles. The opposite angles O P Q and O R Q are obtuse, and the two other opposite angles P O R, P Q R, are acute.

Trapezium, in general, is another square figure, beside the preceding parallelogram. A B C D, fig. 39, is a trapezium, because it is a square figure, or of four sides, and which has not all its sides parallel.

Polygonal, or many-sided figures,

Are such as are composed of more than four right lines; the pentagon is a many-sided figure, being right lined, and having five sides and five angles, such is fig. A, PLATE 6.

The hexagon, or sexagon, fig. B, the octagon fig. C, and all figures having their sides as well as their angles equal, are included under this term, as also all irregular figures of any number of sides whatever.

Arcs, and their summits

An arc is a portion or part of the circumference of a circle, being neither one half nor one fourth of the whole; the dotted part D E, fig. D, of the circle I F G H, is an arc, because it is less than the fourth, I F, of the circumference; the remaining part I H G F is also an arc, because that part is greater than the fourth or half of the circumference.

Summit of an arc, in general implies the central point of the arc; such is K, fig. E, because it is in the middle of the arc L K M; summit of an arc, is also the point where an arc would touch a line. As regards the line O P, the summit of the arc O K P is the point K, because it is the point where the arc touches the line O P.

Planes, and superfices.

A Plane, in general signifies a space or superfices, bounded by one or more lines, such are the figures R, S, T. In relation to these figures the space included within their lines is called a plane. Remark, that all figures having right lined or curved sides, whether regular or irregular, are planes when considered as possessing length and breadth without thickness.

GEOMETRY VI.

Definition's Polygons or many Sided Figures.

Fig. A.

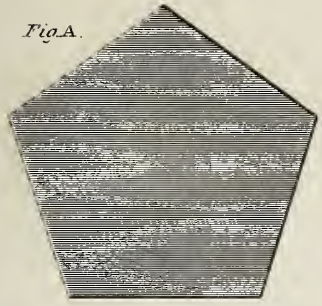


Fig. B.

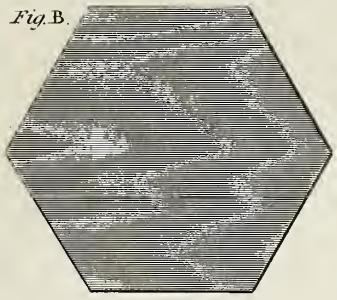
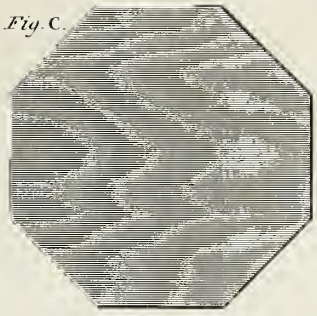


Fig. C.



Arc's.

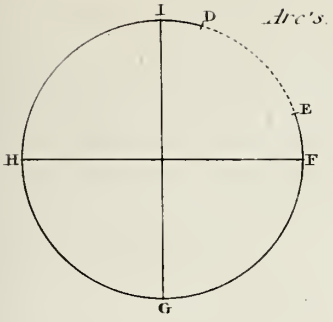


Fig. D.

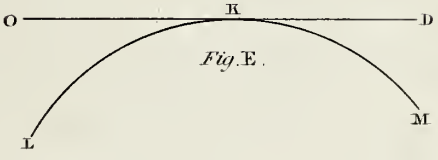


Fig. E.

Planes.

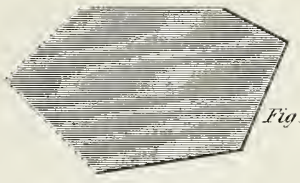


Fig. R

Fig. T.

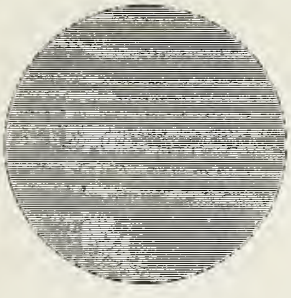
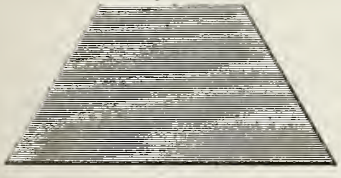


Fig. S.



Superficies.

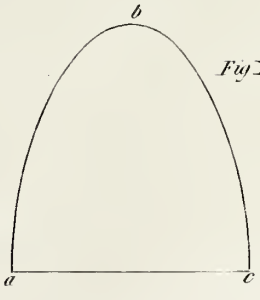


Fig. X

Plane or Section.

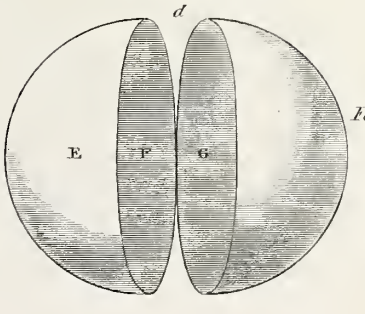


Fig. Y.

Fig. V.

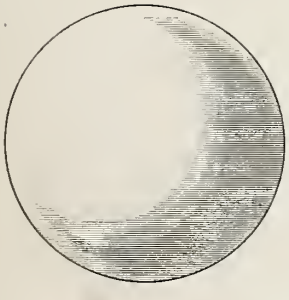
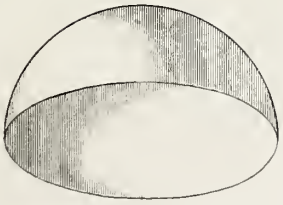


Fig. W.



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GEOMETRY. VII.

DEFINITIONS

Fig. X

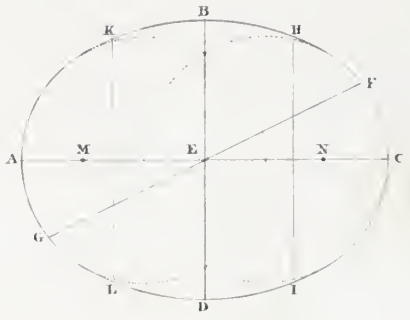


Fig. Y.

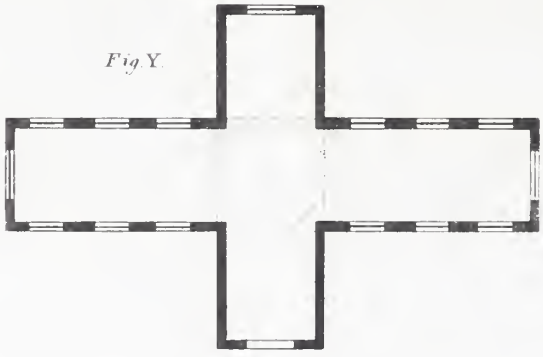


Fig. Z.

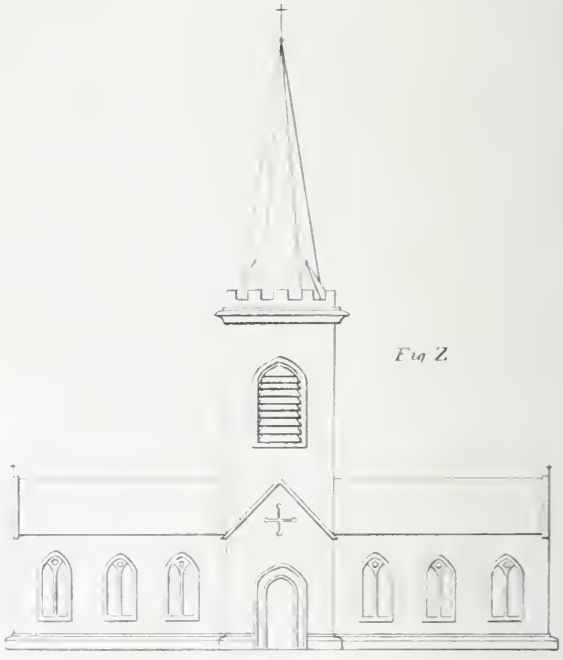


Fig. A.

There are convex and concave superfices or planes, such are the figures V, being convex, and W, concave surfaces.

Parabolic superfice or plane, is a space terminated by a right line and by part of an oval, such is *a c*, fig. X.

Plane or section of a body, is a superfice or flat section, made by a line; the section *d*, of the globe E, fig. Y, by which we see the two superfices F, and G, is what is called a plane or section, because those two superfices are made by one and the same section, which is without thickness.

Surface, or superfice, the air, space, extent, &c. are all synonymous; names serving to express the space contained within the boundaries of any figure.

Ellipsis or oval.

An ellipsis or oval, is a plane figure bounded by a curved line, falling into itself, which is not uniform or circular in any part, but varying continually; being described by two points, called its foci. The further these points are asunder, on which the ellipsis is described, the more it is drawn out or lengthened.

The periphery or circumference, is the curved line that bounds the ellipsis A B C D, fig. X, PLATE 7.

The centre of an ellipsis, is the point E, where any two diameters at A C, or B D, intersect or cross each other.

Diameter of an ellipsis, is any right line, as B D, or G F, passing through the centre, and terminated by the periphery.

Transverse diameter, is the longest line, such is A C.

Conjugate diameter, is the shortest line, for example, B D.

Ordinates, are right lines drawn parallel to the conjugate of any diameter, such are H I, and K L.

Plan or Draught.

A plan or draught, in general signifies a space or superfices, bounded by one or more right lines.

In drawing and design we distinguish three kinds of plan or draught.

1st. The Ichnographic Plan (geometrical, or simple plan,) is that which represents by lines and angles, the space or figure, that is to contain

some elevated body to be erected above the ground. Example: the plan Y, is an ichnographic plan, because it represents in plain lines the outline, or ground plot, occupied by the building Z.

2nd. The Orthographic draught or elevation, is the simple representation of the height of a body, building or other object, with its component parts, without reference to its substance. The figure Z is the orthographic draught or elevation, from the plan of the church Y.

Scenographic draught, is that which represents some object with all its parts entire; that is, the height, length and depth. The figure A is a scenographic representation of the church Z, because it may be considered as showing an object complete in all its dimensions.

PRACTICAL GEOMETRY.

Problem 1.

From a given point A, (fig. 1, Plate 8,) to let fall or draw a line A D, that shall be perpendicular to a given indefinite line B C.

On A, with any opening of the compasses, for example, A E, describe an arc of a circle, cutting the line B C in E and F; on the two points E and F, with the same radius describe two other arcs, intersecting or cutting each other at G; a line drawn from the point A to G, will be a perpendicular line to the given one B C, making on each side an angle of 90 degrees at H and I.

APPLICATION.

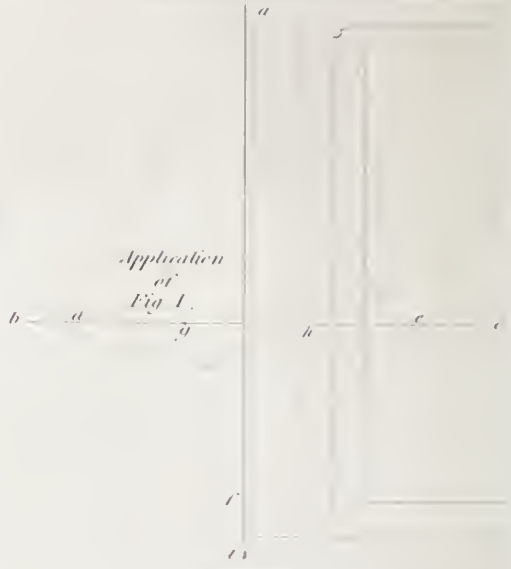
By the aid of this problem in geometry, the Upholsterer, Paper-Hanger, Decorater, &c. can obtain as many perpendicular lines on the walls of an apartment, whether for the hanging of paper, silk, or the laying out in decorative pannelling; in this example we suppose the workman is required to place an ornamental pilaster on the wall of a drawing room at a point *a*. Beneath the point *a*, draw a line *b c*, at any distance on the wall, and parallel with the cornice or floor of the apartment; with any radius *a d* on *a*, describe an arc of a circle, cutting the line *b c* at *d* and *e;* on *d* and *e* with the radius *d h* and *e g*, more than half *d e*, describe two arcs intersecting each other at *f*, then a

PRACTICAL GEOMETRY, VII.

Prob. 1.

Fig. 1.

Application of Fig. 1.

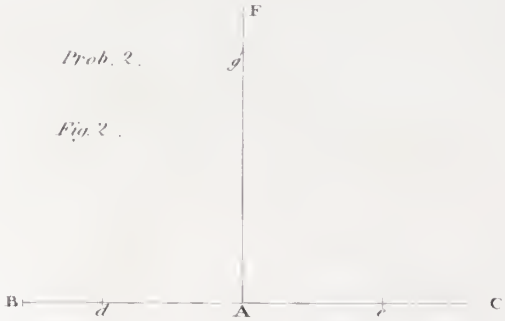


G

Application of Fig. 2.

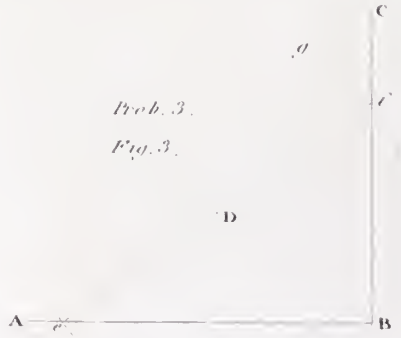
Prob. 2.

Fig. 2.

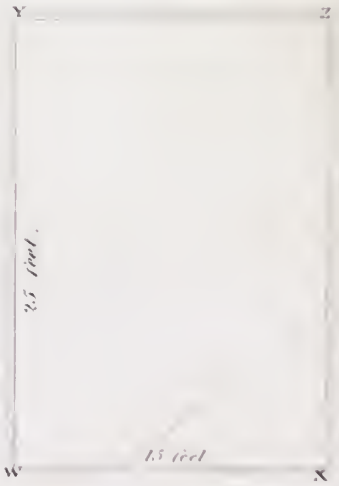


Prob. 3.

Fig. 3.



Application of Fig. 3



line drawn from *a* through *f*, will be a perpendicular to the line *b c*, to which all the other upright lines on the wall must be made parallel.

To prove if the line be perpendicular, stick a pin or nail in the wall at the point *a*, to which attach a plumb line, suffering it to remain at rest at *i*; if the line drawn on the wall be a true perpendicular, it will fall into the line or string *a i*, and be concealed by it.

Problem 2, Plate 8.

From a given point A, (fig. 2, Plate 8,) on a given line B C, to erect a perpendicular A F to that line.

Set off any measure from A, as A *e* and A *d* on the line B C, then on *d* and *e*, with any opening of the compasses more than half B C, describe two arcs intersecting each other at *g*; a line drawn from A through the intersection at *g*, will be a perpendicular to the line B C.

APPLICATION.

In a room, having its end semicircular, or terminated by the arc of a circle, it is required to take the ground plan for a carpet, or the sweep of the wall at top for the window cornices.

In that part of the room from whence the bow commences or springs, draw a line from A to B, which subdivide for a centre as at C, from C set off any space on each side, as C *e*, and C *d*; next take any radius more than half *d e*; then on the points *d* and *e* describe two arcs intersecting at *f*, *f*; proceed next and draw a line from C through *f*, until it cuts the arc or sweep line of the bow at D, which will give the true depth, whether a semicircle or only the portion of one.

Problem 3.

To raise a perpendicular B C, fig. 3, Plate 8, at the end of a given line A B.

Set one foot of a pair of bow compasses any where above the line A B, as at D, and open them until they extend to the end of the line at B, and sweep the arc *e* B *f* at pleasure, cutting the given line A B, in *e*; draw a line from *e* through the central point D, and continue it at pleasure, until

it cuts or intersects the arc B *g*, at *f*; draw a line from B through *f* towards *c*, which line will be a perpendicular to A B; the angle *e* B *f* in this case forming an angle of 90 degrees.

APPLICATION.

In drawing or design, this problem is extremely useful, either for laying down the ground plan of rooms or of buildings: for example, the line W X, being the given width of a room, suppose, fifteen feet, and the length W Y, twenty-five feet, the walls being at right angles or perfectly square, a perpendicular must be raised as before stated, at the point X, and a line drawn parallel to it from the point W, on each of which lines is to be put down twenty-five feet, the length of the room, as W Y, and X Z, then by drawing the line Y Z, the plan will be completed, the four angles W, X, Y, Z, making an angle of 90 degrees each; consequently each line will be perpendicular to that adjoining it; this problem is of great use throughout the whole of geometrical or perspective drawing, and in whatever relates to cabinet work, wherein square angles are required.

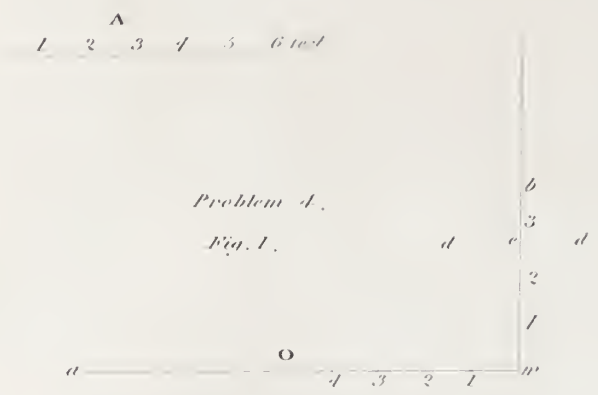
Problem 4, Fig. 1, Plate ix.

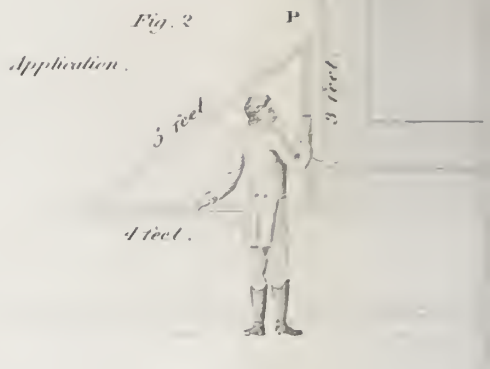
To raise a perpendicular line, *m b*, fig. 1, at the end of a given line *m a*, by means of a scale of feet. Rule: having made a scale of feet, as at A, take three of those feet in the compasses, and setting one foot of the instrument on the point *m*, of the given line *m a*, with this opening strike the arc *d d*; proceed next and take four feet from the same scale, and lay it down on the line *m a*, from *m* to *o*; lastly, take five feet in the compasses from your scale, and setting one foot of the instrument on the point *o*, strike an arc intersecting the other arc in the point *e*, the intersection thus gained will give a point, through which to draw the perpendicular line *m b*, from *m* as required.

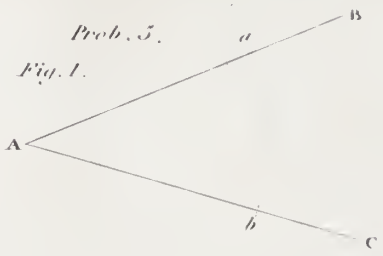
APPLICATION.

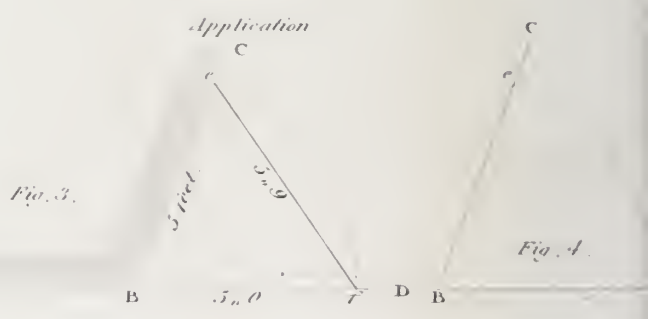
This mode of raising a perpendicular is very useful in the various branches of mechanics. The builder by this mode readily constructs a square, enabling

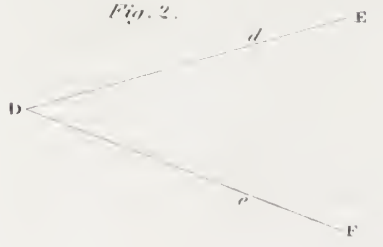
PRACTICAL GEOMETRY, IX.

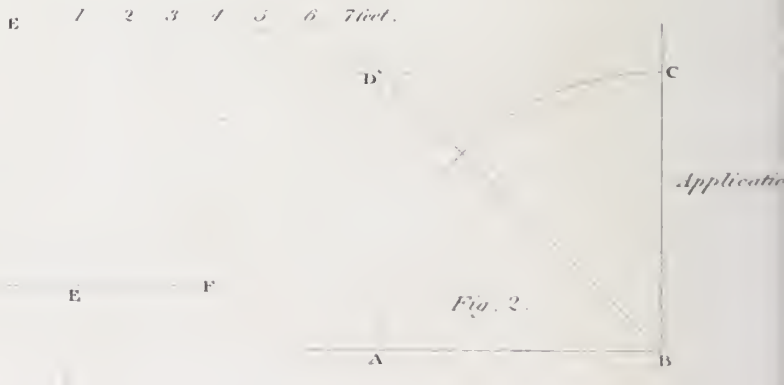












him to lay down his ground plan; for by taking three rods, viz. one of three feet, another of four feet, and another of five feet, and fastening them together, as in the diagram, Problem 4, fig. 2, a square will be readily constructed, by which any angle, that should be a right or square one may be proved. The paper-hanger, by this problem, is also able to construct an instrument which will enable him readily to rule all his perpendicular lines, without the use of the plumb line, excepting where it may be necessary to ascertain the true level on which the square is placed, in which case a plumb line may be attached to the upright edge of the square, as at P, fig. 2, Problem 4, which will always regulate the true level of the square, the plumb line concealing the edge of the square when perpendicular.

Problem 5, Fig. 1.

To make an angle equal to any right lined plane angle given; B A C, fig. 1, Plate 9, is the given angle, and D E, fig. 2, the line given; it is required to make at the point B, on the line D E, fig. 2, an angle equal to the angle B A C. Rule: with any radius or opening of the compasses at discretion, on A, fig. 1, the vertex or point of the given angle B A C, describe the arc of a circle *a b*, cutting the legs, or two sides of the angle in the points *a* and *b;* proceed next to fig. 2, and on the given line D E, at the point D, place one leg of your compasses, having in them the same opening as in fig. 1, and describe the arc of a circle *d e;* make *d e* equal to *a b;* and lastly, draw D F, through the point *e*. The angle E D F, will then be equal to the angle B A C.

APPLICATION.

From this problem we learn to lay down the angle of any room, &c. on paper, a plan of which may be required, whether the walls be right angled, that is to say square, or otherwise. Again let it be required to measure the internal angle C B D, fig. 3: commence by setting off equal measures on the ground from B to C, and from B to D, say five feet on each side, and draw the chord line *e f*, which will be found five feet nine inches in length, or otherwise, according to the measure first made use of; then having drawn

B D, fig. 4, indefinite as to length, or at pleasure; proceed to make a scale of equal parts, see E, under the diagram, fig. 3, which represents seven feet, from this scale take five divisions, or parts, in the opening of your compasses, and placing one foot of the instrument on the angular point B, fig. 4, describe the arc *e f*, cutting B D, in *f*, then on *f*, with an opening equal to five feet nine inches, taken from the scale, describe an arc cutting D C, at *e*, lastly, draw B C, and you will have an angle C B D, equal to the one measured, C B D, fig. 3. Remark: the length of the sides or lines will not make any difference in the angle.

Problem 6.

To bisect a right lined plane angle B A C, fig. 1. Plate 9. Rule: with any opening of the compasses, on the vertex or angular point A, describe an arc, *d c*, at discretion, cutting both legs, A C and A B, of the angle B A C in the points *d* and *c*; then on *d* and *c*, with the same, or any other radius or opening in your compasses, describe two arcs intersecting each other at E; lastly, from A, draw the line A F through E, which will bisect the angle A B C as required.

Or a right angle may readily be divided into two parts after this manner: On the vertex B, of the right angle A B C, fig. 2, with any opening of the compasses, describe the arc A C, cutting the line A B in A and B C in C, on A and C; with the same, or any other radius in the compasses, describe two arcs intersecting at D; lastly, draw the line D B, through E, which will divide the angle equally, as required.—By this problem the workman is enabled to find the true mitre for returning his moulding, either as a Cabinet-maker, or Joiner, &c. with truth and expedition, whether the angle be an internal or external one, for the right angle bisected is the true mitre, and by which all the mouldings will exactly meet and fit at the angles.

Problem 7.

To trisect a right angle, A B C, Plate 9. Rule: with any radius at discretion on the vertex B, of the right angle A B C, describe the arc or quadrant,

A D E C. Then with the same radius in the compasses on A and C, describe the arcs B D, B E, cutting the quadrant A C at the points D and E. Lastly, draw the lines B D and B E, by which means the right angle A B C, will be trisected.

APPLICATION.

This problem is of great use in perspective, enabling us with ease and facility to lay down the vanishing point for the angle of a sexagon, on the horizontal line; its use will also be shown in laying down the line of chords, as on the sector, in a case of instruments.

Problem 8.

To construct an equilateral triangle A B C, Plate 9, on a given line A B. Rule: On A and B, with an opening of the compasses equal to the line A B, describe two arcs intersecting each other at C, draw the lines A C and B C, and the equilateral triangle is then constructed.

This problem is useful in finding the side of any polygonal or many-sided figure, and will be exemplified in the construction of a pentagon, hexagon, &c. &c. it is also of use in trisecting a right angle, as A B E in problem 7.

Problem 9, Plate x.

On a right line E F, fig. 2, Plate 10, to make a triangle similar to another triangle B A C, fig. 1, by means of a scale of feet.

Let a scale of feet or equal parts be made as *d e*, under fig. 1. Now the sides B A and A C, fig. 1, may represent the walls of a room whose sides are not square, but of which a plan is required. Begin and measure the space from A to B, which will be found to measure 8 feet 6 inches; next proceed and measure the side A C, which will be found to contain 6 feet; then a chord line being drawn from B to C, it will contain 6 feet 3 inches, more or less as it may happen; now to lay down a similar triangle for the purpose of making the plan required, draw the line E F, fig. 2, indefinite; and from the scale of feet *d e*, take six divisions which set off from E to F; next take $8\frac{1}{2}$ divisions from the scale in the compasses, and, placing one leg

in the point E, describe an arc *g*; lastly, take $6\frac{1}{4}$ divisions from the scale, or 6 feet 3 inches, in the compasses, and placing one limb on F, describe an arc cutting the other arc *g* at D; draw the lines F D and D E, and the triangle D E F, fig. 2, will be exactly similar to the one measured B A C, fig. 1. For if the triangle D E F, fig. 2, was cut out, and the point E laid on the point A, fig. 1, the one triangle would be found exactly covering the other.

Problem 10, Fig. 1.

To construct a square G H I K, on a given line G H, Plate 10, fig. 1; on either extremity of the line G H, as H, raise a perpendicular H I (by problem 3), make H I, equal G H; then with a radius equal to G H, in the compasses, on G, describe an arc of circle, at pleasure, and on I, with the same radius, describe another arc intersecting it at K; lastly, draw G K and K I, which will complete the square.

Case 2.

Another mode of constructing a square with equal truth may be used; let G H, fig. 2, be the line given on which to construct the square G H I K; on G and H, with the radius G H in the compasses, describe two arcs intersecting each other at M; next bisect or equally divide the arc G M (by problem 11), that is by taking any opening in the compasses more than half the space G M, and placing one leg of the instrument in G, and again in M, describe two arcs intersecting each other at *n* and *o*; a line drawn through the intersecting points will divide G M into two equal parts at P; then on M, with a radius in the compasses equal M P, describe two arcs intersecting H I, at I, and G K, at K, draw H I, G K, and K I, and the square will be completed.

APPLICATION.

The construction of the square is of general use in drawing; in a perfect square each side becomes the tangent to a circle inscribed within it. An elegant and ready mode of constructing an octagon, is obtained by first

GEOMETRY X.

Pro. 9.

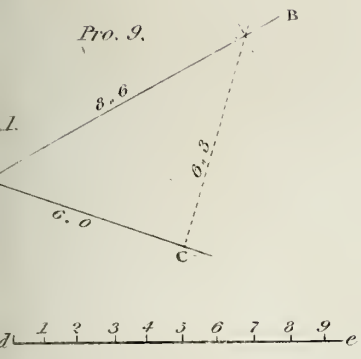
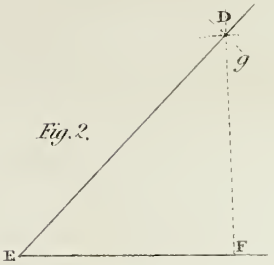
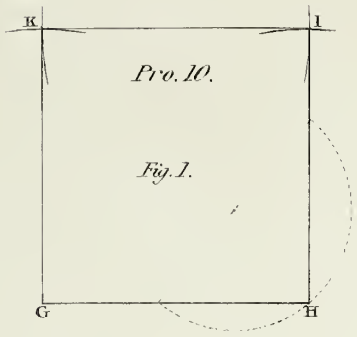


Fig. 2.



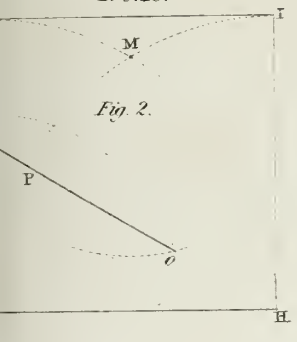
Pro. 10.

Fig. 1.

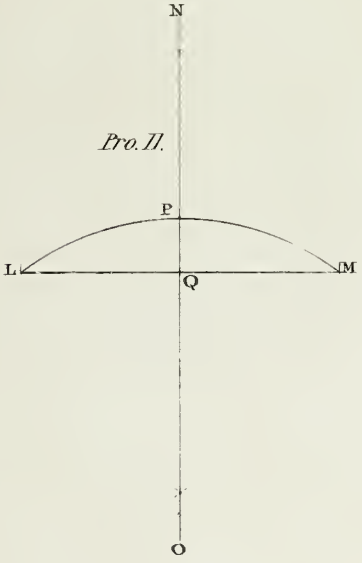


Pro. 10.

Fig. 2.



Pro. 11.



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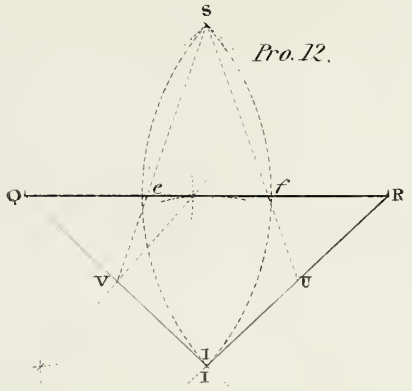

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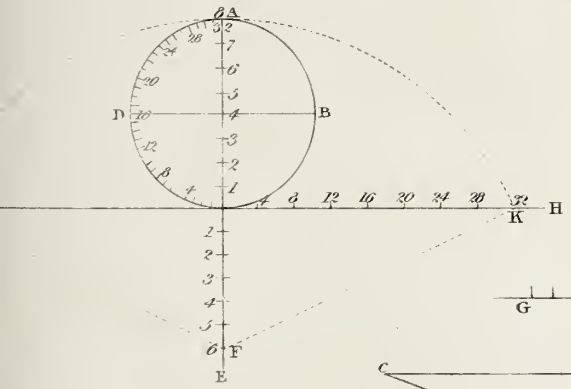


Pro. 14.

Fig. 1.

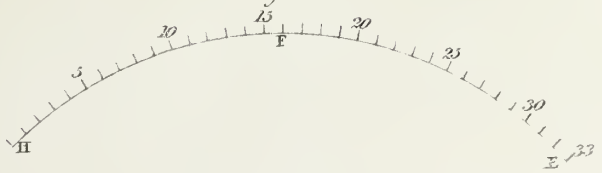
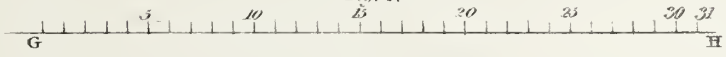
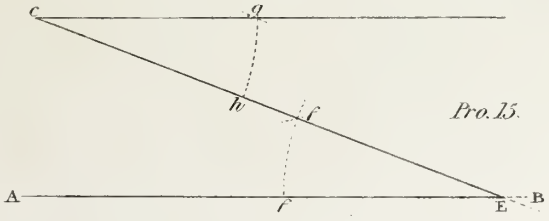


Fig. 2.



Pro. 15.



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making a square, half of one of the diagonals of which, when laid down on the sides, from each corner, will cut off the true sides of an octangular figure.

Problem 11.

To bisect a given right line L M.

Rule: with any radius in the compasses, more than half the given line L M, Plate 10, place one leg in the points L and M, and describe two arcs intersecting each other at N and O. Through the two intersections N and O, draw the right line N O, which will divide the given line L M, into two equal parts at the point of intersection Q; after the same manner, the arc of a circle may be divided as L P M, in the point P.

From this problem an elegant and certain mode is obtained for dividing any given line into two equal parts, without guess or reference to repeated trial by the compasses; we have likewise by the same means, four lines perpendicular to each other, and consequently generating at the point Q, four right angles, containing ninety degrees each, and forming the centre of a circle to which L M, N O, become the diameters.

Problem 12.

To trisect a given line Q R, Plate 10.

With any radius at discretion in the compasses, on Q and R, describe two arcs intersecting each other at S and T, draw the lines Q T and R T, through the intersection at I, each of which bisect or divide (by problem 11), into two parts, at V and U, draw S V and S U, cutting Q R, in the points *e* and *f;* the line Q R will then be truly trisected.

APPLICATION.

The division of a line after this manner being the most correct, is at the same time elegant. It is useful in the construction of polygons, or figures of more than four sides.

Problem 13.

To find a right line that shall be equal to the circumference of a circle.

A B C D is the given circumference of a circle, for which a line is required that shall be equal to it.

Rule: divide the diameter A C, of the circle A B C D into eight equal parts or divisions, prolong the diameter A C, towards E indefinite, and set six of the same parts from C to F, making in the whole fourteen parts from A to F. Through the point C, and on the line A E, draw the right line G H, perpendicular to the right line A E at pleasure, it will then be parallel to the circle's diameter D B. From the point F, as a centre, with the distance F A in the compasses, describe the arc I A K, then the line I K, in respect to its length, will equal the circumference of the circle A B C D.

To prove the truth of this problem, divide C D, which is one quarter of the whole circle, into sixteen equal parts, by subdivisions; that is to say, divide the quarter C D first into two parts, next divide each of the parts so divided into two parts also, you have then the quarter or quadrant divided into four parts; proceed and divide these four parts into two each, and you have eight parts; and lastly, divide the eight parts into two each, and sixteen is the produce for the arc C D; these divisions carried round the circle would divide it into sixty-four equal parts. Take four of these divisions in the compasses, which place on the line G H from C, and continue it eight times, until you finish at K, making then thirty-two parts: C K being half the line, I K will give sixty-four parts for the whole, and thus the line I K shall equal the circumference of the circle A B C D.

This problem is of use to all mechanics who desire to know the contents of an exterior or interior spherical surface; whether the same be a plain curved wall, the inside or outside of a dome.

Problem 14.

To find a right line that shall be equal to a determined curved line.

D F E, fig. 1, plate 10, is the given curved line. Take any small measure in your compasses, so that the curve contained in the portion thus taken, shall not visibly vary from a straight line, carry this measure round the arc or curve D F E, from D unto E; the curve in this diagram will be found to contain this measure thirty-two times, or otherways according to its extent. Proceed and draw the right line G H, fig. 2, indefinite, and from G set off thirty-two such divisions towards H; by which means the line will equal the true length of the curve.

This problem will be found of as great use as the one preceding it; from it we can obtain the contents of the surface of a wall, being the segment of a circle; also the raised ceilings of rooms or beds, partaking of the same form.

Problem 15.

Through a given point C, fig. 3, plate 10, to draw a line that shall be parallel to a given right line A B.

A B is the given right line, C the given point.

Through the point C draw a right line at pleasure, of any inclination, cutting the given line A B in E; take any opening in the compasses, and setting them on E, describe an arc *f f;* which is the opening or measure of the angle C E A, made by the line C E; with the same opening of the compasses on C, describe an arc at pleasure *g h;* transfer the measure of the arc *f f,* on the arc *g h,* or make *g h* equal to *f f;* by which means the two angles will be equal; a line drawn from C, through the point *g h,* will be parallel to the given line A B.

Problem 16. Plate 11.

Where the parallel lines are very long, the following method is to be preferred.

A B is the given line, and C the given point.

Take the distance from the given point C, to the given line A B, in the compasses as C A, and assuming any point E, towards the end of the line A B; describe with this radius, an arc as D; apply a ruler from the point at C, to the top of the arc at D, and draw C D; then shall that line be parallel to the given line A B.

APPLICATION.

The use of these problems is general, and will be found essentially so in the practice of perspective; from them we have the construction of the parallel ruler; of great utility in the making of plans, when unprovided with a drawing board or T square, and in every instance wherein parallel lines are required.

Suppose two plain rulers, *e f* and *g h*, (fig. 1, plate 11,) to be joined together by two upright pieces of metal, so as to form four right angles, as at A, B, C, D, and consequently the metal pieces be perpendicular; then it follows that the four angles being equal, the two rulers must likewise be parallel.

Again; admit these two upright pieces of metal *d c*, *b a*, fig. 2, to be so fixed, as to be capable of motion backward and forward by means of pivots, rivetted at the parts *o*, *o*, *o*, *o*, then it will easily be imagined, that these two rulers may be compressed, or divided the one from the other, continually at equal angles, as may be seen in the figure, wherein the angle *a* equals the angle *c*, the angle *b* equals the angle *d*, consequently the moveable rulers *e f*, *g h*, must be parallel.

From the same problem we have the construction of the bevelled square N G, fig. 3, used by architects and others for drawing inclined lines, that are intended to be parallel one with the other; in perspective also it is of the greatest use in laying down angles for points on the horizontal line, and for casting of shadows, whether from geometrical figures, or objects put into perspective, wherein all the shadows flow parallel. To the Joiner and Cabinet-maker its use is familiar for setting the mitres, whether full or acue.

Suppose A B C, fig. 3, to be a plain T square, on the centre of which at N, a ruler or another T square E F G, be fixed by a thumb screw, so as to be

moveable at pleasure; and conceive the fixed stock A B of the T square A B C to be placed on one edge of a perfectly square drawing board H, all the angles of which I, K, L, M, are right ones, and consequently the sides perpendicular the one to the other; then the moveable square, which at first was parallel and exactly covering A B C, may be inclined at any angle that may be required, as at N. Now imagine the square A B C to be moved along the edge of the board as at I M, it will in its motion downwards, produce a series of lines R O, R P, R Q, parallel the one to the other, every angle at R being equal.

Problem 17.

Any angle which is contained in a semicircle is a right angle.

A B C, fig. 1, plate 11, is the semicircle given. From A draw the line A B of any inclination at pleasure, touching the circle's circumference at B; from B draw the line B C, then the angle A B C, thus formed is a right or square angle. So likewise A *b* and *b* C being drawn, produce a right angle A *b* C; for all angles standing on the diameter of a semicircle, and contained within the circumference, will be right angles.

APPLICATION.

From this problem we have a practical way of raising a perpendicular at the end of a line, (see problem 3,) for the line *d* C *a*, fig. 2, being drawn from *d*, through the centre C, where it cuts the semicircle as at *a*, will produce a point perpendicular over *b*, the corner of the line *d b*.

Mechanics also are furnished by this problem with a mode for ascertaining the truth of their squares; for having drawn a semicircle *a b d*, fig 2, with a radius equal to the length of one side of the square as *a b*, and drawn the line *a d*, apply the corner of the square *a b d*, to any point in the circumference of the circle as at *b*, and one side, on one end of the diameter as at *a*; if the square is a true one, the third point will fall on the opposite end of the diameter at *d*.

Problem 18.

To find the centre of a circle, of which an arc only, or portion, is given

A C B, fig. 1, plate 11, is the given arc.

Draw the chord lines A C and C D, which may be, as in this case, equal to half the segment A C B; or one of the right lines might be made longer than the other; take rather more than half one chord line as C A, in your compasses as at *f*, and on A and C, describe arcs intersecting each other at *g* and *g*; with the same opening, and the compasses transferred to B, describe other arcs intersecting at *g* and *g*, draw right lines *g g* and *g g*, which continue until they meet or intersect each other at H. The point of intersection will be the centre of a circle, of which the given arc A C B is only a portion.

APPLICATION.

By this problem a centre is obtained for describing the arc of a circle, of which we have only three points through which it will pass, as A C B. Let A C B be the bow end of a room, forming the segment of a circle: the real outline of which is required to be drawn. Draw the chord A B on the floor, which may be done by a chalked line, fastened at the extremities A and B, which being raised in the centre and then let fall, will give a correct right line; divide A B into two equal parts, and raise a perpendicular D C, cutting the segment at C, draw the chord lines C B and C A, by means of the chalked line as before, which also equally divide at E and I; next proceed and measure (by a two or three foot rule), the chord line A C, likewise the chord C B, which note or mark down on paper; mark also the distance from D to C; then on the lines C B and C A, at the points E and I, apply your square, and draw lines perpendicular, until they unite in a centre, as at H; which intersection gives a point that will be the centre of a circle, of which the arc or bow is only a part.

In the Upholstery and Cabinet departments, this problem is not without its use, for by the above process, the plan of a room (having its end in the

form of a bow, either as a semicircle, or part of one), may be taken in a rough draught, and from the measures thus noted down, a similar plan may easily be laid down; for instance, in London, although the measure should be taken in any part of the country distant from it, and a carpet be required, it may be thus made up to fit exactly. The sweep of the wall is also obtained, by which the window cornices can be manufactured without fear of want of alteration. It is to be observed that this process will alone answer in cases where the bow or arc forms the segment of a real circle; in some cases the arc or sweep will partake of the section of a cone; for instance, in that, of the parabola, or flattened oval: recourse must then be had to means that will be explained hereafter.

APPLICATION.

The square A B C D, fig. 2, Plate 11, contains a figure representing a block forming part of the support for a pillar and claw table, used either for loo or dining table. The inclined corners A B C D, are parallel to the diagonals of the square, and are always occupied by the feet forming a support for the block on which the pillar is to be placed: to take away from the heavy effect a square block would produce, the sides are usually curved, and in most cases such curve becomes the segment of a circle; to obtain which, the practice before explained must be resorted to. For example: the corners or cants A B C D, being taken off the square, find the centre of each side, and draw a perpendicular line through each as L M and M N, &c. The depth of the sweep being given, place the same from *e* to *f*; draw *g f* and *h f*, which bisect at *i* and *i*, by problem 11, and through these intersections, draw the lines *i*, *i*, until they intersect the line L M, at L, which will then become a centre, from whence the curve line *g f h* may be described; the line M N, being made equal to L M; the point N likewise becomes a centre for striking the sweep on the side D C; which practice made use of on the two other sides C B, and B A, completes the whole figure of the block.

Problem 19, Plate 12.

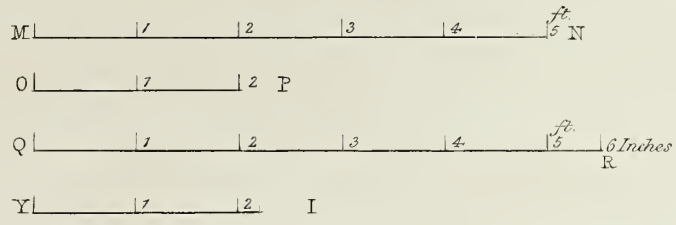
Three lines being given to find a fourth, that shall bear the same proportion to the third that the second does to the first.

M N, O P, and Q R, are the three lines given, and to render the use of this problem clear and positive, the line M N may be considered in length, 5 feet; the line O P, 2 feet; the line Q R, 5 feet 6 inches; now a fourth line is required that shall bear the same ratio or proportion to Q R, that O P bears to M N.

Rule: Draw the line T V indefinite, and from T draw the inclined line T S of any angle at pleasure. On T V, from T to X, set the measure of the line M N; and from T on the inclined line T S, set the measure of the line O P to Y; draw Y X; then from X towards V, set the measure of the third line Q R, and from Z draw a line parallel to X Y, by Problem 15, Plate 10, (or more readily by a parallel ruler as described in Plate 11,) cutting T S in I; then the space on the line T S, comprehended betwixt Y and I is the measure of the fourth line sought. This problem, part of the sixth book of Euclid, is one amongst the many, forming the foundation of arithmetic; it is now introduced, as it may be of service to those, with whom arithmetic, or the rule of three, is not familiar, forasmuch as lines will answer the place of numbers: to elucidate which, in our application of its use, it will be stated both ways.

For example: The line M N may be considered as the top of a sofa or occasional table, and represent a length of 5 feet; the line O P considered as the width, may represent 2 feet; now another table is wanted whose length shall be 5 feet 6 inches, the width of which shall bear the same proportion to such length, as exists in the table of 5 feet by 2 feet.

This may be accomplished arithmetically, by the rule of three, thus:



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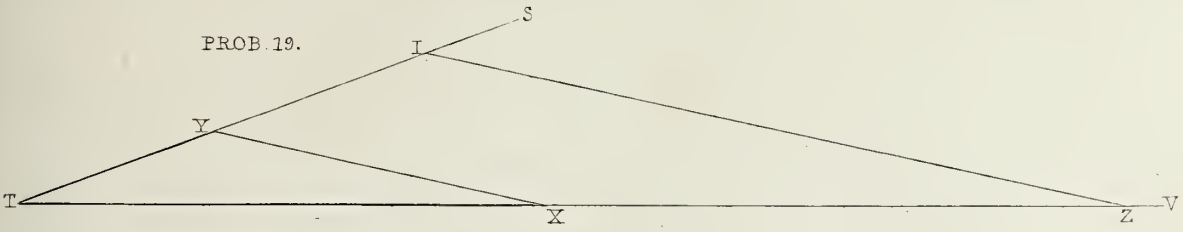
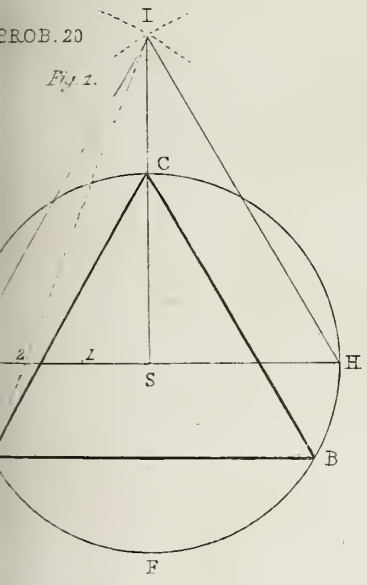


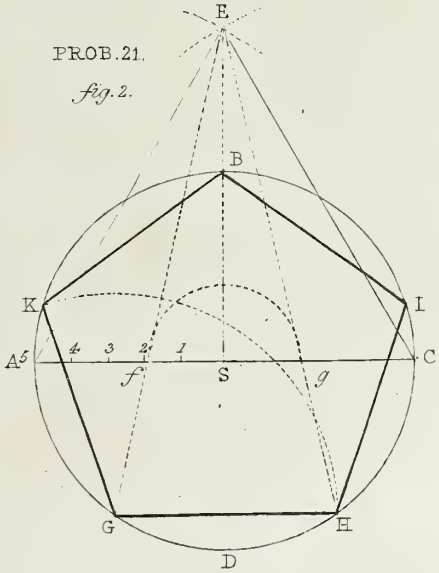
ROB. 20

Fig. 1.



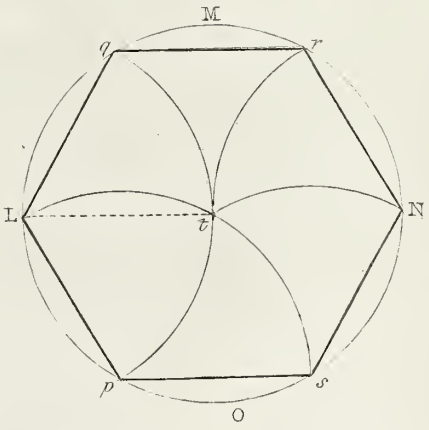
PROB. 21.

fig. 2.

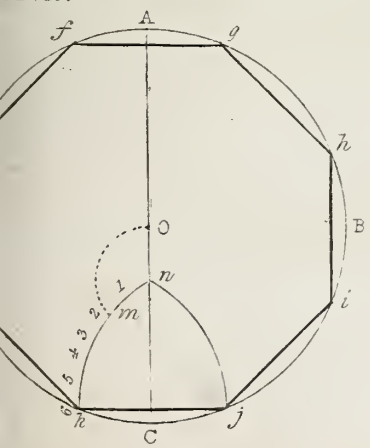


PROB. 22.

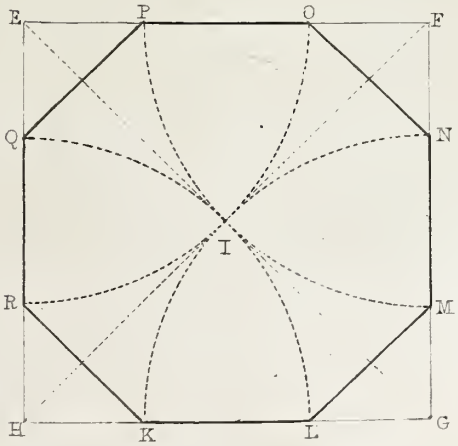
Fig. 3.



OB. 23.

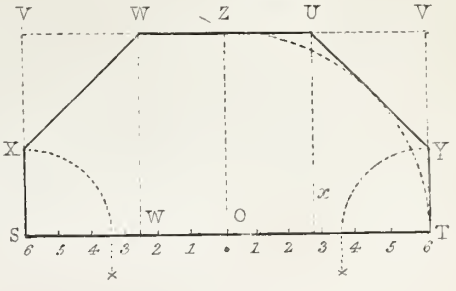


PROB. 24. *Fig 5*



PROB. 25.

Fig. 6.



Published by Jones & C° Aug.st 1826.

If 60 inches produce 24 inches, what will 66 inches produce.

FIRST TERM. SECOND TERM. THIRD TERM.

Stated thus, 60 : 24 :: 66

Multiply by 24 the second term.

264

132

Divide by 60 or first term. 5) 1584

12) 316 4/5

26 Inches product.

or 2 feet 2 inches and a fraction.

From hence it appears that a table 5 feet 6 inches long would require to be 26 inches and a fraction in width, to bear the same proportion as the one 5 feet by 2 feet. To the Cabinet Maker and Upholsterer this problem may be of great use; it can be extended in various ways, in enlarging or reducing designs, from objects that are considered in good and harmonious proportion. To prove the truth of the above problem, we shall refer to the figure, wherein T X represents the length of the top M N, or 5 feet; T Y represents the width of the top O P, or 2 feet; X Z represents the length of another given top to be 5 feet 6 inches, for which a width is required that shall be in the same proportion to 5 feet 6 inches, as 2 feet is to 5 feet; and this we find to be Y I, and which measured by the scale placed on M N, will be found to be rather more than 2 feet 2 inches, being the same as that found by the rule of three.

This problem has been selected as of use to our present purpose; proportional lines extend not only to the foundation of numbers, but afford means for laying down all the lines on the sector, proportional compasses, &c. &c.

Problem 20.

To inscribe a triangle A B C *within a circle* G C H F, *fig.* 1.

Rule: Draw the Diameter G H of the circle through the centre S; on S raise S I, perpendicular to G H; on H, with the radius H G in the com-

passes describe an arc, and on G, with the same radius describe another arc intersecting it at I; draw the lines G I and I H, the equilateral triangle G I H, will then be formed on the circle's diameter G H; divide the semi-diameter S G into three equal parts, each of which will contain 30 degrees. Draw I A through the second division from the centre, and where it intersects the semi-circumference at A, 30 degrees will then be cut off; from A draw A B parallel to G H, until it cuts the semi-circumference at B, then will A B form one side of the equilateral triangle. Draw A C and C B and the equilateral triangle is compleated.

We have often occasion to circumscribe the triangle in a circle, and particularly so in proportioning a triangular block, part of the support for a circular loo table, also for the same description of form in the blocks for screen standards, and for supports of work tables, &c. &c.

POLYGONAL FIGURES.

Problem 21.

To inscribe a pentagon or figure of five sides within a circle A B C D, *fig.* 2.

Rule: Draw the diameter A C, half of which divide into five equal parts at 1, 2, 3, 4, 5. On A and C, with a radius, or opening of compasses equal to A C, describe two arcs intersecting each other at E, draw the lines A E and E C, from E; then from E, through the second division from the centre S, draw the line E *f*, and continue it until it cuts the semi-circumference A D C, in the point G; draw G H parallel to the diameter, cutting the semi-circumference also at H, which line will pass five times round the circle at the points G, K, B, I, and H.

It is here necessary to remark, that the intersection through the points *f* and *g*, on A C, at G and H, as they cut the circle, must be very carefully taken; and further, that in passing them round the circle's circumference, the point must invariably fall in the line of circumference, and not the least out of it.

This mode of dividing the diameter into as many parts as the figure possesses sides, will answer for every polygonal figure circumscribed by a circle; there are many other modes of dividing the circle's circumference, so

as to obtain the sides of regular polygonal figures; but as these figures seldom come under the attention of the Upholsterer or Cabinet-maker, we shall proceed only in giving the readiest rules for the formation of such of them as may be useful in those branches, and in the first instance proceed with the hexagon or figure containing six equal sides.

The truth of this problem may be thus explained; every circle containing 360 degrees in its circumference, it follows that one half such circle must contain 180 degrees, and such is A D C in fig. 2. An equilateral triangle, whose base is made by the diameter of a circle, being divided into any number of equal parts, if lines be drawn from the top or apex of the triangle, through the divisions on the base line, it will divide any line placed below it, proportionally, provided that line is under the same angle, and within the limbs of the triangle, if extended; by the same rule, the semi-circumference of a circle, under the base of a triangle, will be divided into as many equal parts as are contained in the base line of such triangle.

The diameter A C, of fig. 2, is divided into 10 parts, each part containing 18 degrees, and numbered from the centre S; now as 36 degrees are cut off from the centre, by a line passing from E, through the second division at *f*, and intersecting the circle's semi-circumference at G; so will a like measure be cut off, on the other side the centre at H, by the line E *g*, cutting the semi-circumference at H; making together 72 degrees, which is the measure of a side of a pentagon. Therefore drawing G H parallel to A C gives the side required.

Problem 22.

The circle L M N O, *fig.* 3, Plate 12, *is required to be divided into six equal parts, forming an Hexagon.*

Rule: To preserve a parallel form in the upper and lower parts of this figure, begin by taking L *t* in the compasses, (the circle's radius,) and placing one leg of the instrument in the point L, describe the arc *q p;* next proceed and place the compasses at the point *p*, and describe the arc L *s;* again, on *s*, with the compasses describe the arc *t* N; and lastly, with the instrument on the point N, describe the arc *t r*. You will then have six points, L, *q*, *r*,

N, *s*, *p*, which being joined together by right lines as L *q*, &c. completes the hexagon. Remark, that great care must be taken to note the intersection of each arc on the circle's circumference, as the least variation may occasion the trouble of going repeatedly over the same ground, to make the sides agree; for let it be noted, that although the operation in this case is mechanical, the calculation is mathematical, and depends entirely on a point considered in itself indivisible.

This figure is of frequent use, and will often come before the Mechanic's observation. The bow end of many apartments in country houses partake of one half of this form, particularly where the gothic style is adopted; in Hall Lamps, the marble tops of tables, and various other instances it falls into use. The hexagon has this singular property over all other polygonal figures, that it will join and come together without any loss of room: the cell of the industrious bee is thus constructed.

Problem 23.

To construct an octagon from a given side.

Rule: Let *k j*, fig. 4, Plate 12, be the side given; on *k* and *j*, with a radius equal to the given side, describe two arcs intersecting at *n*; draw the line A C, through *n*, perpendicular to *k j*; next proceed and divide the arc *k n* into six equal parts, and on *n*, with the radius *n m*, equal to two parts describe the arc *m o*, cutting the perpendicular A C, at *o*, then will the point *o* become a centre for describing the circle A B C D, round which *k j* will pass eight times at the points *e f g h i j k l*.

The octagon, is a figure in such general use, that it will be needless to say more respecting it than we have in describing the hexagon.

Problem 24.

In a given square E F G H, *fig.* 5, Plate 12, *to construct an octagon.*

Rule: Draw the diagonals G E and H F, whose intersection at I will give the centre of the square; then on the points E, F, G, H, with the opening

in the compasses E I, (equal to one half the diagonal line E G,) describe arcs cutting the side of the square E H in Q and R; the side E F in P and O; the side F G in N and M; and lastly, the side G H in K and L: draw the lines Q P, P O, &c. &c. and the octagon is compleated.

This manner of constructing an octagon is considered by Geometers the most elegant.

Problem 25.

The diameter of an octagon being given to find the sides.

Rule: Let S T, fig. 6, Plate 12, be the diameter given; bisect it at the point O, and divide each half into six equal parts, numbered from the centre O; on O raise a perpendicular to S T, at pleasure, and set the distance O T, on the perpendicular from O to Z; then through T, draw the line V V indefinite, but parallel to S T; proceed, from the points *w* and *x*, (which are betwixt the second and third divisions right and left of the centre O,) and raise the perpendiculars *w* W and *x* U, cutting the line V V at W and U. On T and S, with a radius in the compasses equal to two divisions and a half, describe two arcs, cutting the perpendicular S V at X, and T V at the point Y. Join U Y and W X, and the half octagon is completed.

This problem will be found very useful in taking the plan of any octangular bow end of a room, where the figure forms half of a regular octagon; which may be readily known, first by measuring the width or span of the bow S T; and next, measuring the depth O Z; then if O Z measures one half the whole width S T, you may be assured the octangular form is that of a regular one, being included in one half of a square S V, T V. This problem will also be found of use in the practice of perspective, and by which the trouble of making a geometrical plan may be avoided.

Problem 26.

Ellipsis or Oval.

The transverse or longest diameter A B, *fig.* 1, Plate 13, *being given, to find the centres* C *and* D; *and the centres* E *and* F, *on the conjugate or shortest diameter* G H; *by which to construct the Ellipsis.*

Rule: Divide the line A B into three equal parts, and construct on the central division C D, two equilateral triangles C E D and D F C: the points or apex of the triangles will then become the centres for describing the curved lines *g h* and *i k;* continue the sides of the triangles indefinite; namely, E C to *i;* E D to *k;* F C to *g;* and lastly, F D to *h.*

On C, as a centre with the radius C A, describe an arc intersecting the lines F *l* and E *o,* at the points *g* and *i;* on D, with the same radius or opening in the compasses, describe another arc intersecting the lines F *m* at *h,* and E *n* at *k.* On the focus F, with the radius F *g* and on E, with the same radius, describe the arcs *g h* and *i k,* which will compleat the ellipsis. Remark, the length and breadth of this kind of ellipsis, holds the proportion of three to four, or nine to twelve; that is to say, if the longest diameter contains four parts, then the conjugate or shortest diameter will contain three parts, or if the longest diameter shall contain twelve parts, then the shortest will hold nine parts

Problem 27.

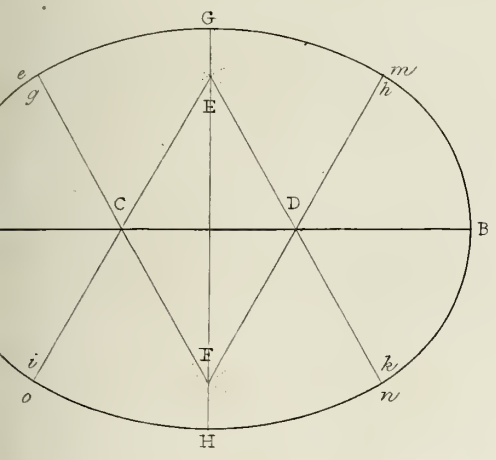
To find the foci of an ellipsis A B C D, *fig.* 2, Plate 13, *the longest diameter* A C, *and the shortest diameter* B D *being given.*

Rule: Take half the longest diameter A C in the compasses, and on the point B of the shortest diameter, with such radius describe an arc intersecting A C in the points *e* and *g;* which points will become the foci for generating the ellipsis.

By this problem we are enabled, with a string and pencil, to describe a true ellipsis; for having found the foci on the longest diameter (*e* and

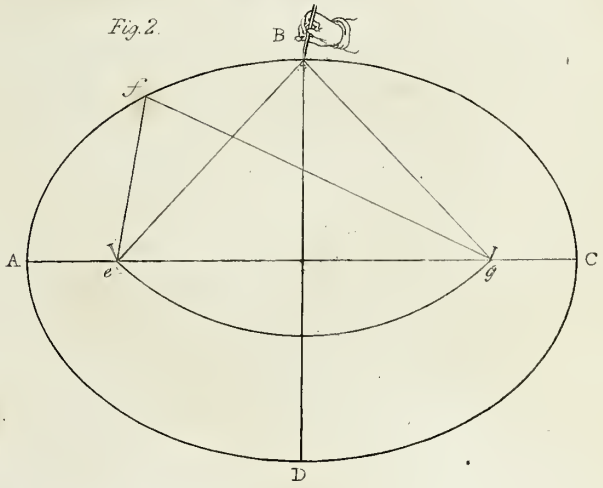
PROB. 26.

Fig. 1.



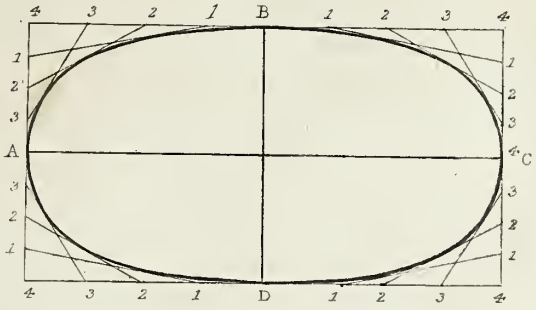
PROB. 27.

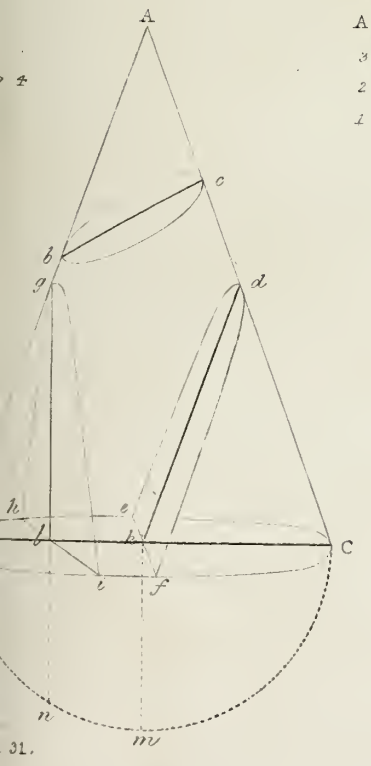
Fig. 2.



PROB. 28.

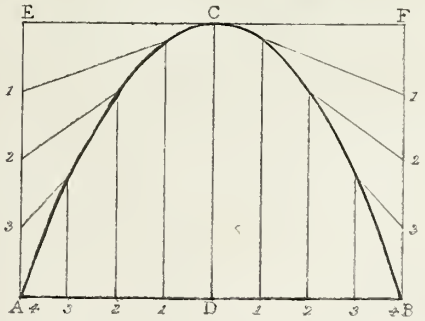
Fig. 3.





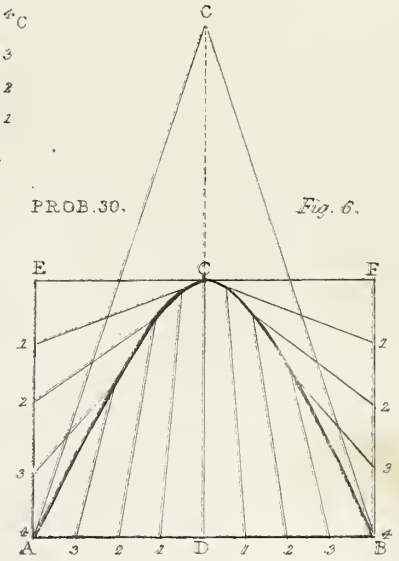
PROB. 29.

Fig. 5.

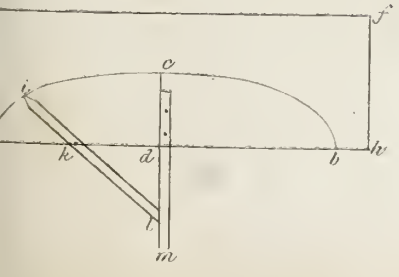


PROB. 30.

Fig. 6.



31.



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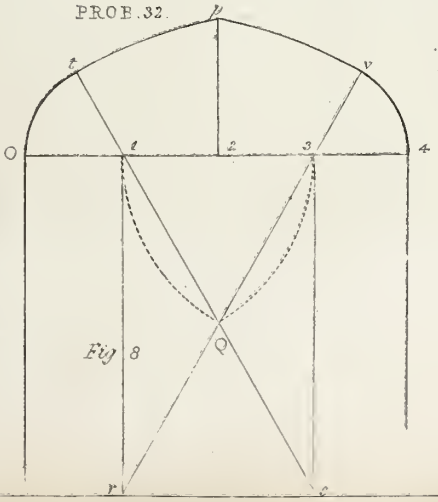


Fig. 8

PROB. 33.

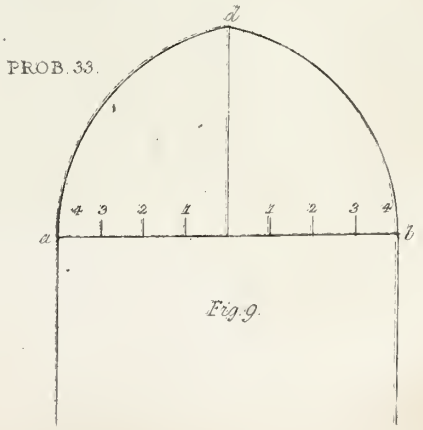


Fig. 9.

London. Published by Jones & C° Aug.ˢ 1826.

g,) let two pins be fixed, then passing a packthread or line, of equal substance, round these two points, connect the two ends together, in such a manner, that they shall form a triangle, whose apex or point shall meet the shortest diameter, as at B; then with a pencil, chalk, or any other marking substance, held steadily in the hand to this point, proceed and move the string towards A; it will then in its progress pass through the point *f*, onwards to A, round to D and C, and finish at B, from whence it started. Note: the further these foci are asunder from each other, the more oblong will be the ellipsis; and the nearer they are towards each other, the nearer the ellipsis will approach to a circle, provided the same length of string be made use of; but if the foci coincide or meet in a point, then the string will be equally extended, and the curve so described will be a complete circle, whereof that point is the centre. All this is easily apprehended by a view of the figure, and may be tried by a string and two pins, as described above.

Problem 28.

To describe an ellipsis by means of ordinates, the diameters being given as before.

Rule: Let A C, fig. 3, Plate 13, be the longest, and B D the shortest diameters given; through the points B and D, draw lines parallel to the diameter A C, at pleasure, and through the points A and C, draw two other lines parallel to B D, meeting at the points 4, 4, 4, 4; divide each half diameter into four equal parts (or more if required), as figured 1, 2, 3, 4; proceed and draw lines or ordinates, from B 1 to A 1, and from B 2 to A 2, and from B 3 to A 3, repeating the same in the other three quarters; a curve so traced, that in its progress touches the lines 3, 3; 2, 2; 1, 1; betwixt, or in the centre of each intersection, will form the ellipsis required.

For laying down working drawings, this mode of using ordinates is to be preferred.

Sections of the Cone.

Every Grecian moulding owing its beautiful outline to some section of the cone, and such outline being regulated by the particular section made;

whether it be perpendicular to the base, parallel to the cone's axis, more or less inclined to it, or lastly, if parallel to the sides; it has been thought necessary to explain the same by a diagram, shewing the different forms made by such sections, as at fig. 4.

First, if a cone be cut directly through its axis A, and perpendicular to its base B C, the section made will be that of an isoceles triangle as A B C, fig. 4.

Note: For the sake of elucidation, the base of the cone in this diagram is put into perspective.

Secondly, if a cone be cut by a line parallel to its base, such section will be a circle.

Thirdly, if a section be made by a line passing through the cone, intersecting both its sides, and inclined more or less to the base, such as *b c*; then the section thus made, will form an ellipsis or oval.

Fourthly, if the section be made by a line parallel to one of its sides, as at *d k*, the figure formed by such section will be a parabola, as *d e f*.

Fifthly, if a cone be cut by a right line as *g l*, perpendicular to its base or parallel to its axis, the section made will be an hyperbola, such as *g h i*.

We will now proceed to give the construction of each figure produced by the sections before mentioned, viz. that of the parabola, and hyperbola; a description of the ellipsis being fully described in problems 26, 27, and 28, any thing further respecting it is here unnecessary, we shall therefore hasten to explain the construction of the parabola, by

Problem 29.

To describe the parabola from the cone.

Suppose the section to be made at *d k*, fig. 4, Plate 13: on *k*, with the radius *k* B, describe the semicircle B *m* C, which represents one half the base of the cone; proceed and drop a perpendicular from *k*, until it cuts the semicircumference at *m*, which line will then measure half the width of the parabola. Transfer this measure on a line from A to D, and from

D to B (fig. 5), the length of which line A B will be the width of the parabola; draw A E and B F, perpendicular to A B, which make equal to *d k* in fig. 4; draw E F; on D draw D C perpendicular to A B, and divide each half, from D, into four parts as figured; and from each division raise a perpendicular: next, divide the lines A E and B F, each into the same number of equal parts, numbering from the top downwards; draw the lines C 1, C 2, and C 3, cutting the corresponding perpendiculars on the base; namely, No. 1 on A E, to cut No. 1 on A D; No. 2 on A E, to cut No. 2 on A D, and so on for all the rest; a line traced through these intersections will be the outline of the parabola.

Problem 30.

To describe the hyperbola from the cone

Suppose the section to be made at *g l*, fig. 4, Plate 13; continue *g l* until it cuts the semi-circumference at *n*, represented by the dotted line *l n*, which will then measure half the base of the hyperbola, and *g l* will be its height; transfer this measure twice on A B, fig. 6, that is, from A to D and from D to B; raise perpendiculars from A, D and B as before; then on D set up the height (*g l* fig. 4), from D to C, and through C draw E F parallel to A B; divide A B, A E and B F as before; next set the whole height of the cone from D to G; then lines drawn from the divisions on the base A B to this point, and intersecting the lines drawn to C from the corresponding divisions on the heights A E and B F, will give points through which the form of the hyperbola may be traced.

Problem 31.

To describe an eliptical arch by means of two laths of wood.

Let *e f g h*, fig. 7, Plate 13, be a board or plane, on which the arch is required to be drawn.

Suppose *a b* the width of the arch, and *c d* its height at the centre; at the central point nail down a slip of wood, so that one edge shall pass through

it; take another slip, and size it to one half the length of the arch, and from one end of this lath, as at *i*, place the height of the arch as at *k*; through this point pierce a thin pivot, until its point come through the opposite side of the lath; if then the slip *i l* be moved along the edge of the board from *d* towards *g*, keeping the hand on the pivot at *k*, it will in its progress describe one half of the reqnired arch as *c i a*; observe, likewise, that the end of the lath *l*, must be kept moving up the edge of the perpendicular lath *c m*; the other half from *d* to *b* may be described after the same manner.

Problem 32.

To find the centre for describing a Saxon arch.

Let *o* 4, fig. 8, Plate 13, be the width of the arch, which divide into four equal parts as numbered. On No. 1, with an opening in the compasses equal to 1, 3, describe an equilateral triangle, whose apex Q, shall be below the line *o* 4; then drop perpendiculars from 1 and 3 indefinite, and continue the sides of the triangle until they intersect them at the points *r* and *s*, continuing the same upwards at pleasure; on Nos. 1 and 3, with the radius 1 *o*, describe the two haunches of the arch, stopping them on the lines at the points *t* and *v*; then on *r* and *s*, with the compasses extended to *t*, describe the remaining arcs *t p* and *p v*, and the arch required will be completed.

Problem 33.

To find the centres for describing a Gothic arch.

Let *a b* be the width given, which divide into eight equal parts, numbering one half, by 1, 2, 3, and 4, from the centre right and left, to *a* and *b*; draw *c d* perpendicular to *a b*; then on No. 1, with the compasses extended to *b*, describe the arc *d b*, and pursue the same method for the other half *a d*, which will give the form of the arch.

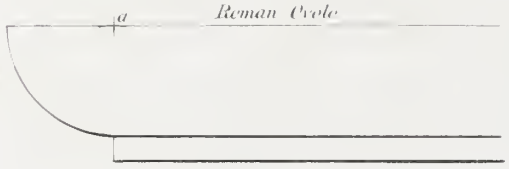
The two preceding problems are applicable to various purposes; in laying down the lines for bed and window cornices, the diagonal ribs for dome teasters, also the heads for bookcase doors, and Gothic blinds, &c. &c.

GEOMETRICAL FIG. PLATE I

MOULDINGS.

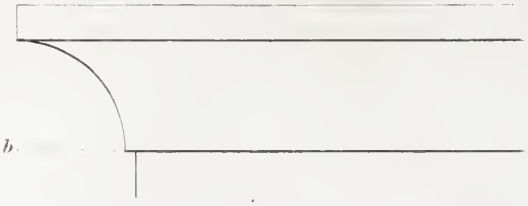
Roman Ovolo

Fig. A



Cavetto

Fig. B

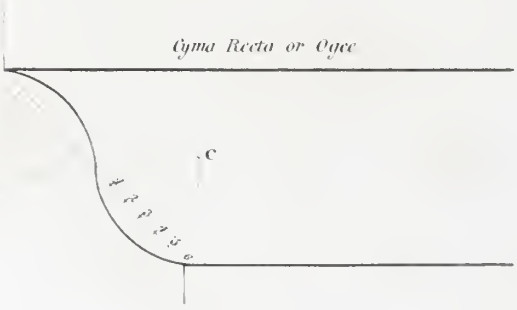


Bead

Fig. C

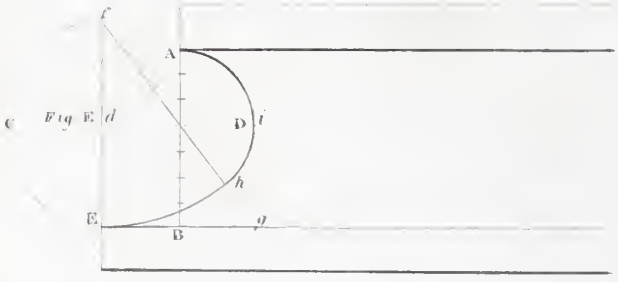
Cyma Recta or Ogee

Fig. D



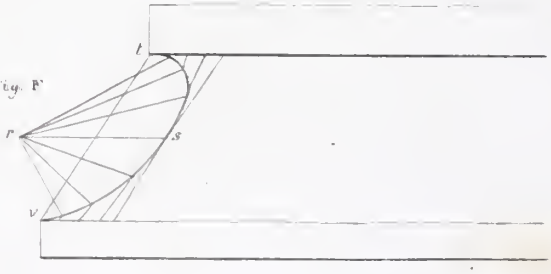
Scotia

Fig. E



Greek Scotia

Fig. F

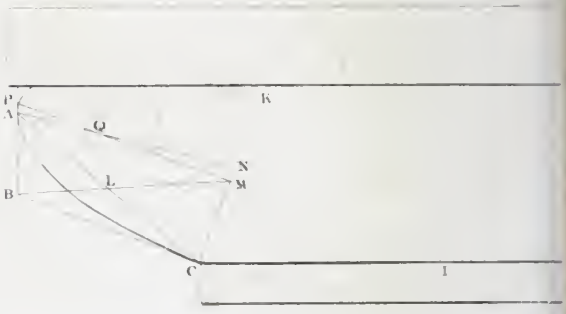


Parabolic Echinus

Fig. G

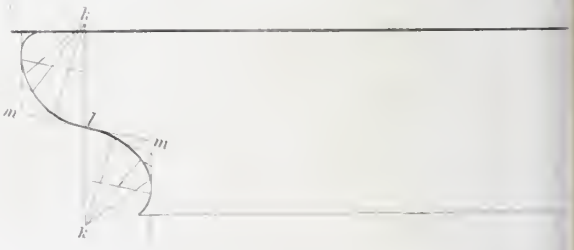
Eliptical Echinus

Fig. H



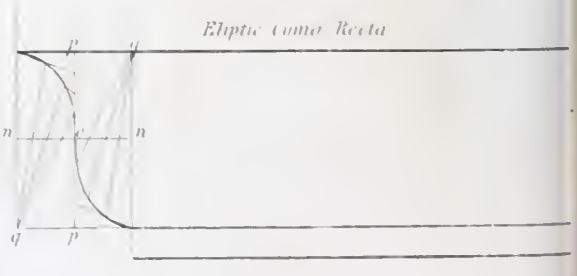
Cyma Reversa

Fig. I



Eliptic Cuma Recta

Fig. K



GEOMETRICAL FIGURES.

Mouldings. Plate 1.

Mouldings partake of two characters, the one after the Roman, the other after the Greek; mouldings of the first character, have for their outline, the quadrant or quarter of a circle, whether such outline be concave or convex. They are either simple in their form, or compounded. The outline of the Roman scotia is an exception to this rule, its form being generated by the segments of a circle. Grecian mouldings have for their outline a curve, formed by a section of the cone; such section being either perpendicular to the cone's base, as is the hyperbola; inclined to it, but parallel to one of the sides, as is the parabola; or inclined to the base, and cutting both sides of the cone, as is the ellipsis.

In Plate 13, of Practical Geometry, fig. 4, this has been fully explained; it is, perhaps, necessary to remark, that the sweep, generated by a conic section, gives to the Grecian mouldings, not only their graceful outline, but a decided preference as far as regards their use. Sir William Chambers, observes, "that an assemblage of essential parts and mouldings is termed a profile; and on the choice disposition and proportion of these, depends its beauty or deformity. The most perfect are such as are composed of few mouldings, varied both in form and size, fitly applied with regard to their uses, and so disposed, that the strait and curved ones succeed each other alternately. In every profile, there should be a predominant member, to which, all the others ought to be subservient, and seem made either to support, to fortify, or to shelter it from the injury of the weather; as in a cornice, when the corona is the principal, the cyma or cavetto serves to cover it, and the modillions, dentals, ovolo, and talon to support it. When ornaments are employed to adorn the mouldings, some of them should be left plain, in order to form a proper repose; for when all are enriched, the figure of the profile is lost. In cornices the square members should not be ornamented; neither should the different facies of architraves, or plinths of columns partake of any decoration; for they are, generally speaking, either principal in the composition or used as boundaries to other parts; in either of which cases their figure should be distinct, and unembarrassed.

These observations, correct, in themselves, are equally to be attended to, as well by the cabinet maker as the builder, to whom they were originally addressed.

The outline of the Roman mouldings being formed by segments of a circle, the first object is to find the centres for describing their curves, whether simple or compounded; we shall, therefore, commence with the ovolo, as being the most simple.

To find the centre by which to describe the ovolo or quarter round, fig. A.

Having the projection from the fillet, and the height of the moulding given; take the measure of the height in the compasses, and from the extreme projection of the ovolo set back this measure by an arc as at *a*, which will then become a centre for striking the outline of the moulding.

To describe the cavetto, fig. B.

The projection and height of the moulding being given, as before; proceed and from the upper fillet or projection, drop a perpendicular, and continue the bottom line of the moulding, until it intersects at *b;* which point becomes the centre for striking the cavetto.

The astragal or bead C, may be described by taking half its height; and this measure set back from the given projection will give a centre, by which to turn the ouline of this moulding.

To describe the cyma-recta, or ogee, fig. D.

The projection of the upper fillet from the lower one, and the height of the moulding being given, join the extremities of both fillets by a right line, which divide into two equal parts, then proceed and subdivide one of these divisions into six equal parts, as numbered in the figure; take five of these parts or divisions in the compasses, and from the extremity of each fillet, describe two arcs, the one right, and the other left; and with the same radius on the central point, describe two other arcs intersecting the former at C and G, which points are the centres for striking the convex and concave curves, forming the outline of the moulding.

To find the centres by which to describe the Roman scotia, fig. E.

Let A B be the given height of the moulding between the fillets, and E B its projection at the base; divide the height on a perpendicular line A B (dropped from the edge of the upper fillet) into seven equal parts from A to B; on E, the edge of the lower fillet, raise a perpendicular indefinite; and through the third division from the top, draw a line C *i*, parallel to E B, intersecting this perpendicular at *d*: make *d f* equal to *d* E, as shown in the figure by the dotted semicircle; from *f* through the third division draw the line *f g* at pleasure; the point on the third division will then become the centre for striking that portion of the arc contained betwixt the points A and *h;* and *f* will be the centre for striking the remaining portion from *h* to E, which completes the outline of the scotia.

To describe the Greek scotia, fig. F, *by means of ordinates.*

The height of the moulding being determined, let *t* be the projection of the upper fillet, *v* the projection of the lower fillet, and *s* the greatest depth of the hollow; join *t* and *v* by a right line, which first divide into two equal parts, through which division draw a line, parallel to the upper and lower fillets, intersecting another line drawn parallel to *t v* at *s;* and let *r* be equally distant from the line *t v* as is *s;* divide each half of *t v* into four equal parts, and the depth of the scotia into the same number of parts, top and bottom; from each of which divisions draw lines tending to *s;* from *r* draw lines also through the divisions on *t v* intersecting the corresponding lines tending to *s;* namely, the first division from the top to intersect the first division from *t*, the second from the top to intersect the second from *t*, and so on for all the rest, the same to be observed below from *v*, through which points the outline of the moulding may be drawn.

To describe the Greek echinus, fig. G, *its outline being parabolic.*

Let F C be the given height, and A F the utmost projection. Draw the lines A B and B C, which may be considered as two tangents to a parabolic,

curve, the one A B perpendicular to the line of the moulding; the other B C, inclined to it; which inclination may be made from one half, one third, or one fourth of the whole height, of the moulding from the base; next divide A B into five equal parts, and leave one for the quirk of the moulding at top; through the remaining four divisions draw lines tending to C; and from A, draw a line parallel to B C, intersecting the perpendicular F C at E, which also divide into four equal parts: make E F equal to E C, from which point, draw lines through the divisions on A E, figured 1, 2, 3, 4, until they intersect each its corresponding line, drawn from A B to C, as before described in the preceding figure.

To find the two axes or diameters by which to describe the echinus moulding, fig. H, *taking the form of an ellipsis for its outline; the point* C *being one of the extremities of the shortest axis.*

The height of the moulding being given, let P be its utmost projection beyond the lower fillet; from this, drop a perpendicular at pleasure, and let A be any measure set from the top you please, which is to form the quirk: let the distance B from the bottom be less than one half the whole height. Join A C, which bisect at L, and draw B C; from C draw a line perpendicular to B C at pleasure; and from B through L draw another line intersecting this perpendicular at M, which will then become the centre of the ellipsis to be described; through the point M draw the line I M P parallel to B C at pleasure, upon which line the longest diameter must be placed. Set the distance C M from A to Q, through which point from A draw a line intersecting the perpendicular C M at N, the length of which from A to N will measure one half the longest diameter, which must be set upon the line I M P before drawn from the centre M equally right and left; and lastly M C, will measure half the shortest diameter, which must also be repeated to K. These diameters being found, the foci for striking the ellipsis may likewise be found by problem 27, Practical Geometry.

To describe the cyma reversa, fig. I, *or ogee, by means of ordinates.*

The height and projection of the moulding being given as before, commence by dividing the projection into two equal parts; through which draw a perpendicular equal to the height, which also divide into two equal parts, as at *l;* and through this division draw a line of any inclination at pleasure, intersecting perpendiculars raised from the ends of the moulding as at *m m.* The quirks at top and bottom being taken off; from these, draw lines parallel to *m m,* each terminated by the perpendicular line *k k;* then proceed and find the ordinates as before described, for the parabolic echinus, marked G

To describe the cyma recta, fig. K, *by the same means.*

Having the height and projection of the moulding given, as before, form the same into a parallelogram, the sides of which divide into two equal parts, each way; through which division draw lines, *n n, p p,* perpendicular to each other, intersecting in the point *o;* from whence the divisions must commence for finding the ordinates, and proceed as before directed; *q q* being dividing points for those divisions placed along the line *n n.*

All these mouldings have been selected as being in general use, and may be used either for the upper mouldings of cornices for windows, bookcases, &c. as D and K, where they form a finish; in regard to mouldings for supporting table tops of marble or wood, we may use in either case those marked G H or I; the same mouldings reversed, may be adopted for bases.

Geometrical Figures, Plate 2.

In this Plate are given five various ornamental pieces, intended for friezes, bands or mouldings, and which have been as variously used by the ancients. The Fret or key moulding, has the highest claim to antiquity, existing from the earliest period amongst the Chinese and Persians, from whence it was carried into Egypt, and from thence into Greece, embellishing their buildings, as well as their vases; it was probably composed from the form of writing used amongst the Persians, where a similar orna-

ment denotes a sentence. From the nature of its construction as to form or pattern, an endless variety may be obtained, and which has been beautifully practised by the Etruscans on their fictile vases; in Cabinet-work the patterns, fig. 1 and 2, in the present Plate, executed in metal of a mixture of ormolu or bronze, are proper for the friezes of cabinets, bookcases, or commodes; in decoration their use is tastefully employed as bands, or in borders; and in every case they will not fail of producing a chaste and pleasing effect The cabled moulding, fig. 3, as a base moulding to Cabinet-work, either cast in metal or carved in wood, will always produce a richness of effect, particularly so if executed in ormolu, and has been thus happily appropriated on many occasions by our French neighbours. Fig. 4 and 5, present two specimens of the antique guiloche, used by the Romans at their happiest period; forming the ornament for the bands in the division of their arched ceilings, and tastefully adopted in the torus mouldings of their columns; these forms have also been greatly used by paper-hanging designers, and profusely so by the carpet manufacturers; in patterns, therefore, of such general appropriation, rules for their construction cannot but prove acceptable.

To form the Greek Fret, fig. 1.

The width of the pattern being determined, as A B, divide such space into thirteen equal parts, and draw lines parallel to A A and B B, from such divisions, the whole length of your intended pattern. Take one division from the width, and repeat it on the lines A A or B B, and draw perpendiculars throughout the whole length; you will then have divided your pattern wholly into small squares; by retaining or rejecting more or less of these little squares, the pattern is formed, and it will thus be dependant for its beauty in form and use, according to the taste and ability of the designer; in the present design, the pattern in its length is composed of two figures, the one half of the pattern occupying twelve of the squares, the other half pattern eight squares in length: observe, that the band, or what is called the Fret, and the spaces between, are always equal in size; thus the bands X, X, X, X, occupy the space each, of one of the divisions, and the dividing spaces the same measure likewise.

GEOMETRICAL FIGURES, Plate 2.

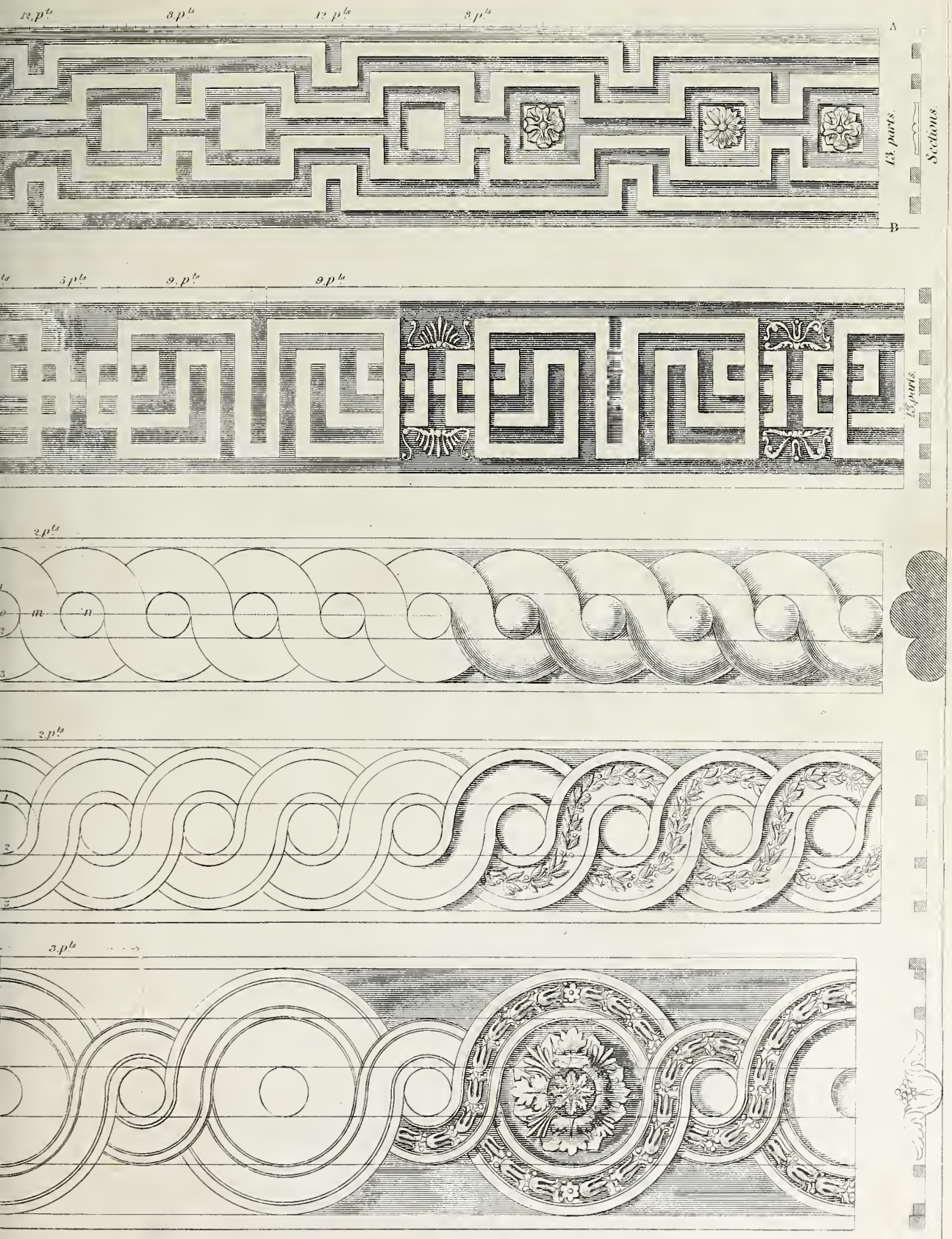


Fig. 2 is constructed entirely on the same principles, and, therefore, needs not a repetition; a little practice in drawing these figures will render any difficulty small, and afford much amusement.

To form the cable moulding, fig. 3.

Divide the width E F into three equal parts, as numbered 1, 2, 3; then subdivide the second division into two equal parts, for a central point, and describe the small circle *l;* this may then be called the eye; on the same centre, with an opening in the compasses, equal half the width E F, describe two semicircles uniting at *m;* next proceed and set two of the divisions from *o* to *n,* and then *n* will again become another centre, from whence to continue your circles; the whole length being gone through after this manner, the lines or portions of the pattern not wanted to remain, are to be rubbed out.

FIGURE 4.

This pattern is divided exactly into the same proportion; as is seen by the numbers 1, 2 and 3, on the width G H; only a band is added, which the figure shows; the space betwixt the bands, admits of being filled with various ornaments agreeable to the fancy of the artist.

FIGURE 5.

This elegant specimen of ancient design in ornamental decoration, is constructed on similar principles, to the two figures preceding it; only the width of the design or pattern I K, must be divided into five equal parts, the central one X, forming the eye, whose centre becomes the point by which to strike the larger and smaller circles; in this design one division is appropriated for the band, which again has two small fillets taken out of it; this pattern, like the other two, is equal throughout, in its divisions, having three parts between centre and centre, as is seen in the figure; of the highly beautiful manner in which this pattern has been enriched by our forefathers in decoration, the present design will give some idea.

Geometrical Figures, Plate 2.

Let A B, fig. 1, be the given height for a Greek or Etruscan shaped vase, without including the base: in the present example it is intended to shew one half only, as the other half must be worked by the same process; the line A B is, therefore, considered as a vertical one, and passing through the centre of the vase; let this line be divided into three equal parts, from A to B, as numbered 1, 2, 3: next give two of these parts for the height of the belly or body of the vase, set up from A to C; and take one and a half of the same parts for one half the width of the vase from C to D, from which drop a perpendicular D E indefinite; draw a line from A, perpendicular to A B, until it intersects the line D E, at F. Divide A F into eight equal parts, and number them, beginning with the first from the centre A; divide F D also into the same number of equal parts, and number this line likewise, beginning at the first division above F. Proceed and draw lines from No. 1, above F, to No. 1, at A; from No. 2, on F D, to No. 2, on A F; from No. 3, on F D, to No. 3, on F A, and so on for all the rest, for every number from 1 to 8 on the line F D; which will produce an intersection of lines generating points as noted by the marks 8×—7×—6×—5×—4×—3×—2×—; through these points of intersection, which must be very carefully noted, the parabolic curved line forming one half the body of the vase from D to A, may be faithfully traced. For the remaining height of the vase (or one part), from C to B, let it be divided into five equal parts as numbered, and let two parts, form the turnover, and mouldings of the upper part, as G H. Again, divide G H into three equal parts, and give one to *i k*, which will form the lipping.

Having given one and half parts, as C D, for the width of one half the body of the vase, give two thirds of the whole height, for the utmost projection of the lipping, as B L; the outline of which, as shown at L, forms an ellipsis; the hollow necking under it *m n*, makes also for its outline, the fourth of a parabola, as shown by the numbers; the base A M, in height, is equal to the upper mouldings (B O), of the vase, taken together, which may be divided into five parts, and one part A X, given for the necking betwixt the bottom of the vase and the plinth X M, forming the base. The width

GEOMETRICAL FIGURES. II.

The Geometrical Method, used by the Etruscans & Greeks, for outlineing their Vases.

Fig. 1.

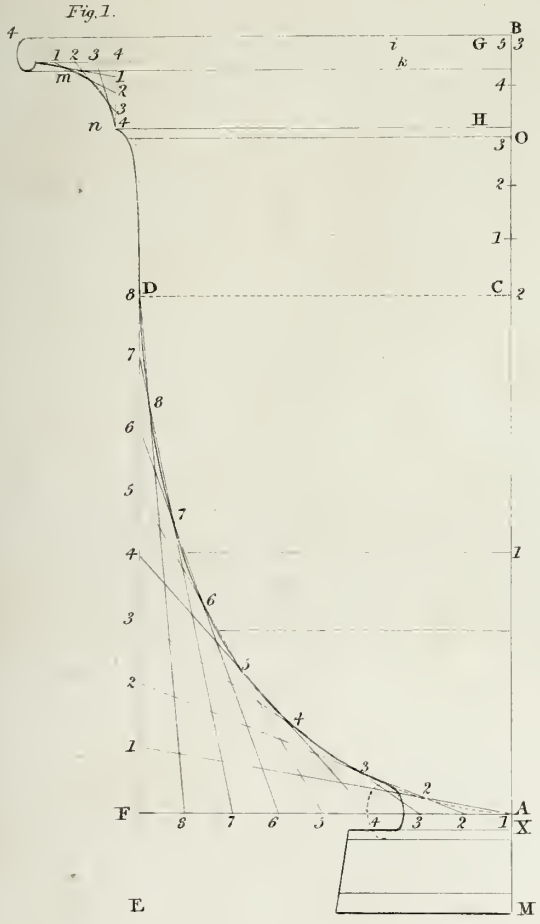
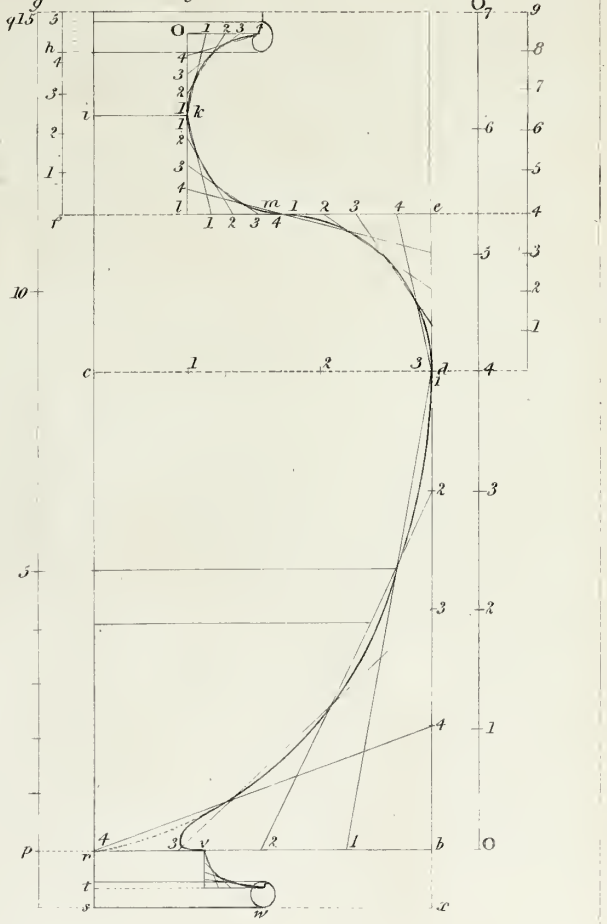


Fig. 2.



Sebast.o Serlio's Method.

Fig. 3

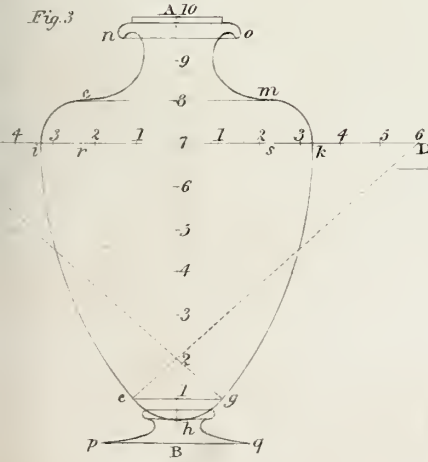


Fig. 4.

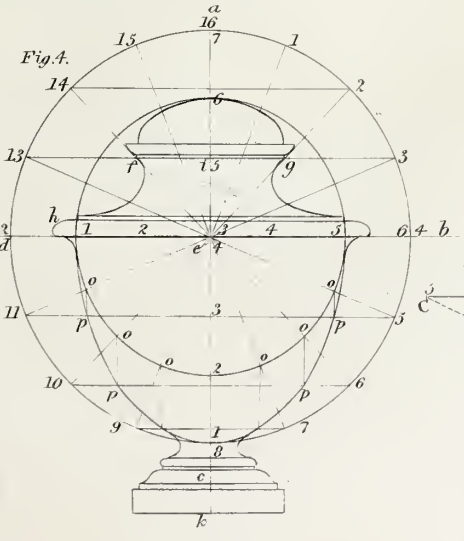
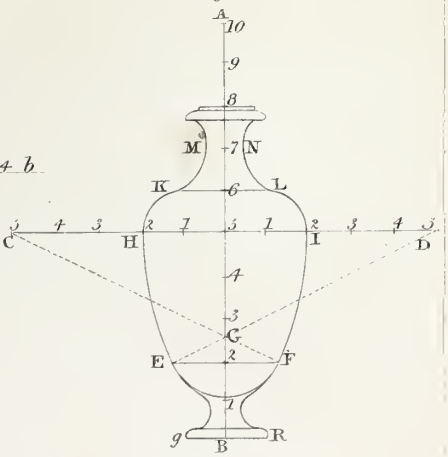


Fig. 5.



London Published by Jones & Co. Aug. 25 1826.

of the base at top will be found to be twice X M, and the width at M below, may be made a small portion more. The beautiful outline exhibited in all these fictile vases (valuable remains of antient art), has resulted from their artists' thorough knowledge of the conic sections, and of the rules of proportion, by which one part is made to suit with another, in harmonious accordance; an excellence only to be obtained by the same labour and research as used by these antient artists.

Fig. 2 represents a vase, constructed on similar principles, but shewing a different outline, its height a b being given as before.

Divide the whole height *a b* into seven equal parts, as numbered on the line *o o*, and set off four of these parts from *d* to *b*, which must be numbered, beginning from *d;* make *d c* equal to three such parts, for one half the width of the body or cup. Divide *b r* into the same number of parts, as is *b d*, which number likewise progressively from *b:* then divide the upper height of the vase from *d* to *a*, into nine equal parts, and make *e d*, or the shoulder of the vase, equal to four of the parts; the remainder *(e a)* of the height will then form the neck: divide this height also into two equal parts at *i*, and make the width of the neck *(i k)* equal to the same measure; draw the line *o l* perpendicular to *i k*, and dividing *l k* into four equal parts, make *k o* equal to three of such parts, and divide this also into four parts: draw the line *l e;* and make *l m* equal to *l k;* dividing this measure also into four parts: next divide *m e* into four parts, also *e d* into the same number. From these five divisional lines *o k*, *k l*, *l m*, *m e*, and *e d*, the ordinates as numbered, are to be drawn as described in fig. 1; and through their intersections the curves forming the neck and shoulder of the vase may be traced. The same practice must be used in regard to the lines *d b* and *b r*, which will produce an outline for the belly or body of the figure. Divide the height of the neck *f g* into five equal parts, and give one-fifth for the lipping *g h*, which again divide into four, and give one for the upper fillet; make *g n*, which is half the mouth of the vase, in diameter equal to one and a half parts out of the seven, on the line *o o*, into which the whole height is divided. Lastly, divide the whole height into fifteen equal parts, as on the line *p q*, and make the height of the base *r s* equal to one of these parts; divide *r s* into two parts,

which will give *t s*, for the torus or base moulding, the remainder for the hollow; the width *s w*, is equal to one-fifth the whole height, or half *s x*.

These two examples have been selected out of many of those beautiful specimens of antient art now in existence; the same principles are applicable to all of them, and it is evident, that the change of numbers will produce, and does account for the endless variety in shape to be found in these objects. The principles exhibited in these specimens were very little known, until communicated to the late Sir W. Hamilton, by an Italian artist, whose great assiduity and toil enabled him to ascertain the system on which these valuable remains of the antients were constructed.

Figures 3, 4, and 5, are examples taken from the works of Sebastian Serlio, a celebrated Italian architect that flourished in the sixteenth century; they are here introduced to show the advantages resulting from a knowledge of Geometry, and to prove how highly its rules are to be estimated, as they relate to the doctrine of proportion. In the example, fig. 3, the proportion (that is to say of width to height), is as 3 to 5; in fig. 4, as 2 to 3, and in fig. 5 the proportion is as 1 to 2.

We shall now proceed by giving Serlio's rule for outlining these three last figures, and first as to fig. 3, which bears the proportion of 3 to 5. Begin by dividing its given height A B into ten equal parts, and draw a line indefinite through the seventh division at right angles to A B; on which line set six divisions right and left from the centre, each equal to those on A B, as at C and D: through the division No. 1, draw *e g* indefinite, and on 2, with a radius equal to one division and a half, describe an arc intersecting the line drawn through 1, at *e* and *g*, which will terminate the outline of the vase at bottom. On D and C, with an opening in the compasses equal D *e* or C *g*, describe the arcs *e i* and *g k:* draw a line through 8, at pleasure, and on *r* and *s*, with a radius equal to one division (7-8), describe two segments, cutting the line 8 at *l* and *m*, which will form the shoulder of the vase; divide the space 9-10, into two equal parts, and give one for the upper member, or lipping, and make the whole width of this lipping equal to three divisions, as *n o;* the curved line of the neck may then be drawn by hand; the base *p q* will be found nearly equal to four divisions, and its height equal to three-quarters of one of the same.

Figure 4.

Let *a k* be the given height of the vase, which divide into 7 equal parts as numbered; through the fourth division draw the line *d b* indefinite, and at right angles to *a k;* then with a radius equal *a e* on *e*, describe the circle *a b c d*, one half of the circumference of which divide into eight equal parts; draw lines from them, through the centre *e*, cutting the opposite semi-circumference; also draw ordinates or lines parallel to the diameter from each of these points, as 2×. 3×. 5×. 6×. 7×. Divide the diameter *d b* into six parts, and on *e*, with a radius equal to two parts, describe a smaller circle, as shown by the figures 6, 5, 2, 1; this smaller circle will then be equally divided by the lines passing from the larger one, through the centre *e;* which lines will generate intersections or points in the smaller circle at *o, o, o, o, o, o*. Drop a perpendicular from each of these intersections cutting the ordinates 5, 6, 7, at *p, p, p, p, p, p;* through these points right and left, the curved outline, forming the body of the vase, may be drawn. The lines 2-10, and 14-6, in their progress to the centre, cut the ordinate 3, 13, at *f g;* which intersection gives the width of the neck: the hollow curve may then be drawn by hand; the upper moulding may be made one-fifth of the height from *i* to 6; the moulding *h*, one-fourth the height from *e* to *i;* the base *c k*, in height is equal to one division, and may be divided into three parts for its mouldings; its width being something more than its height.

Figure 5.

This vase although differing in shape, its outline is obtained precisely on the same principles as fig. 3, which makes it here unnecessary to go over the explanation again, further than to observe, that the bottom sweep of the vase is obtained by taking a radius of one division and a half in the compasses, and setting it on the half space betwixt 2 and 3, as at G, which becomes a centre for striking the arc E I F; the points C and D will likewise become centres for striking the arcs E H and F I; the neck M N is equal in width to one division, the lipping *o p* to two of the same, which also gives the width of the base Q R, and its height is equal to half its width.

Note: The divisions on A B are equal to those in fig. 3, but the vase having less of these parts in width than the other, its height becomes less in proportion, reaching no higher than the eighth division.

Geometrical Figures, Plate 3.

The globe, fig. 1, Plate 3, *being given, to find the shape of the gores, so that when applied on its surface, they shall be found to join each other, and cover it exactly.*

Divide one-fourth of the circle's circumference (*k l*, fig. 1,) into three equal parts, and from these points, draw ordinates, or lines, parallel to the diameter *l m*, as 2 *o o*, and 1 *p p*; make *q k*, right and left of the centre, equal to half of a division, and draw the lines *q e*, *q e*: produce the line *k n*, indefinite, on which set the measure *k* 1, *k* 2, *k* 3, on the quadrant from *k* towards *n*; and through each of these describe arcs, as at *k* 1 and 2; proceed and take the measure *p p* from the triangle within the circle, and transfer it on the sweep line *k n*, as marked *p p*; next take the measure *o o* from the same triangle, and transfer it on the arc at 2, marked *o o*; then lines being traced from the apex 3, through these points on both sides, will give the outline or figure of the gore, making a twenty-fourth part of the covering requisite for the whole surface of the globe.

Case 2.

Another method may be adopted, thus: proceed and draw a right line E F, at pleasure, which may be considered as a parallel section through the globe, and answering to the line of the equator; draw another line A C, at right angles to this line, and set the three divisions as numbered on the quadrant, fig. 1, from E to A, and from E to C; draw A B and C D, at pleasure, each parallel to E F, and make the length of the line E F double A C, which will then equal the whole circumference of the globe, fig. 1; through F draw D B, parallel to A C; next divide the line E F into twelve equal parts, and number them as marked; and, lastly, take an opening in the compasses equal to nine of these divisions, and setting one foot in E,

GEOMETRICAL FIGURES. III.

Fig.1.

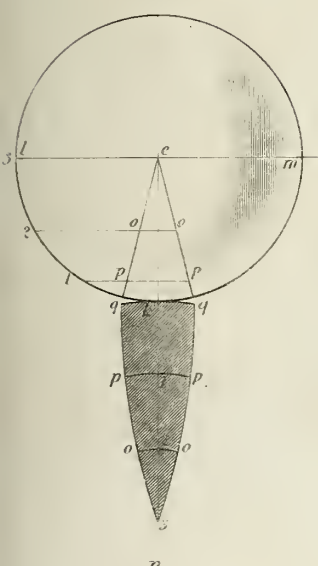


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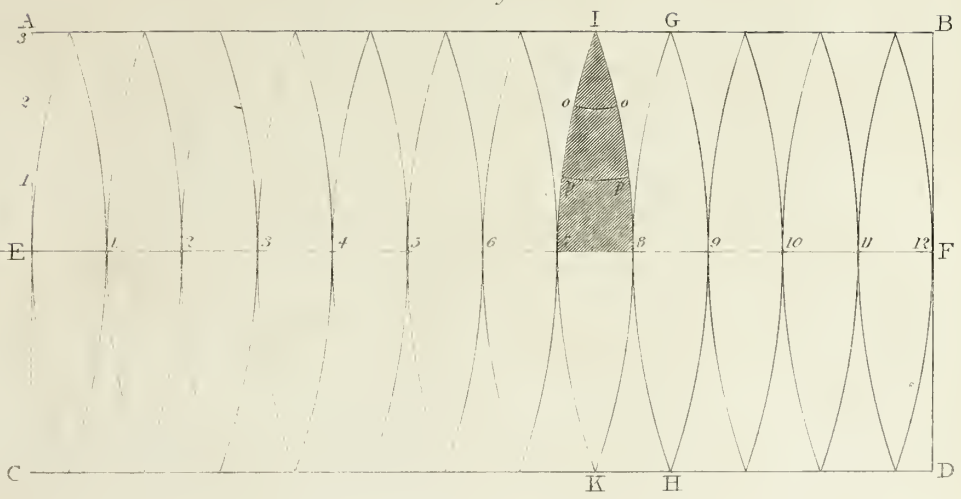
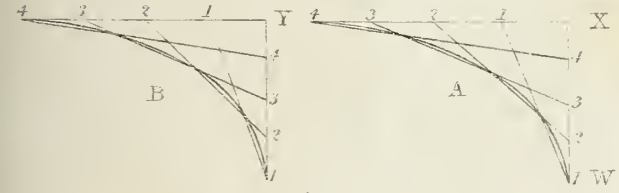
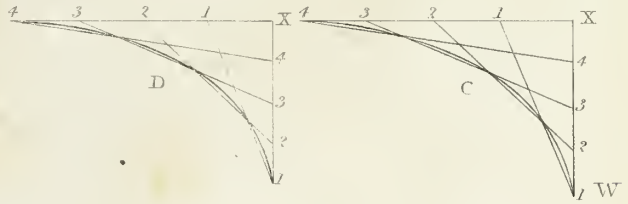
Fig.2.







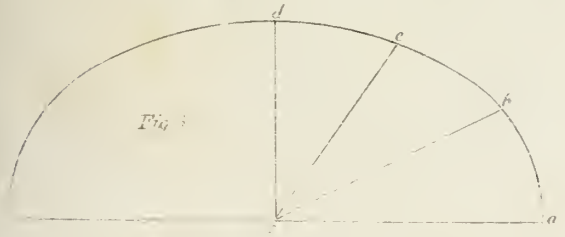


Fig.3.

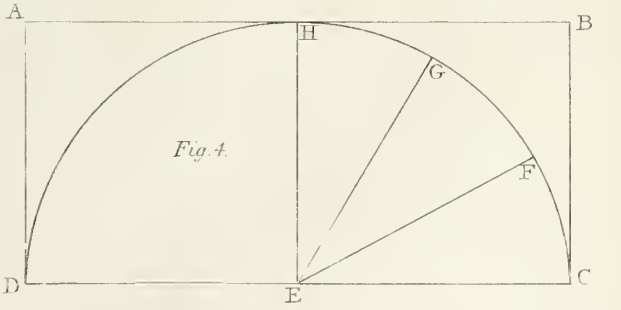


Fig.4.

Fig.5.

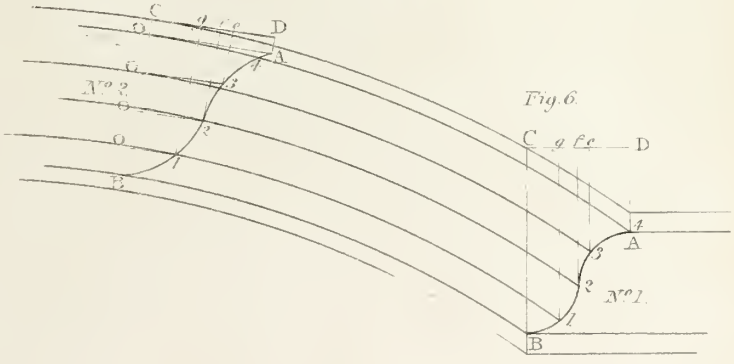


Fig.6.

describe an arc cutting the parallelogram A B C D, at the points G and H; and with the same opening on No. 1, describe another arc through No. 10; then on No. 2, describe a similar arc through No. 11, and on 3 describe the arc passing through No. 12. To produce all the remaining arcs, the line E F will require to be extended both ways, to receive as many of the same divisions as will be found necessary to strike the arcs right and left; the outline of all these gores will be found exactly of the same size and shape as that in fig. 1, as is plain by a reference to the letters in each figure.

REMARKS.

The line E F, fig. 2, is equal to the whole circumference of the globe, fig. 1, measured round the line *l m*, and may be called the equatorial line, dividing the globe into two equal parts: the curved lines in the parallelogram A B C D, are each, equal in length to one half the globe's surface, from north to south, or from east to west, and are called meridians, or lines of longitude; the line E F, and all lines drawn on the globe parallel to it are called lines of latitude.

These problems are useful to the Cabinet-maker, Upholsterer, and more so to the decorative artist. In bedsteads having dome teasters, the Upholsterer, by these, finds the lines for shaping a pattern or gore, enabling him to cut out his covering, either for the exterior or interior surface, without loss or waste.

The Cabinet-maker is also enabled to get out his veneers for covering a dome from the base to its summit. The decorator is readily able, by the same means to shape the mould on which to draw his design, and which, when applied to the part required, will be found to fit exactly.

To find the true curve or outline for the ribs of an elliptical dome.

Fig. 3, is the half plan of an elliptical dome for a bedstead; *d a e* representing one quarter, and *e d*, *e c*, *e b*, *e a*, four of the ribs. To find the outline of the rib *e a*, set its length on a line from Y to X (fig. A), and the given height of the dome, on another line at right angles to it, as from X to W; next, divide each of these lines into four equal parts, as numbered, and

draw the lines 1 1, 2 2, &c. as ordinates, whose intersections will give points through which to draw the curved line of the rib required.

Fig. B represents the curve line for the rib *e b* in the plan, and is obtained by the same process. The outlines for the two other ribs *e c* and *e d*, are got in a similar manner. These four moulds will answer for all the rest.

In fig. 4, A B C D represents half the teaster of a regular four post bedstead, and D H C half the plan of an elliptical dome; E H, E G, E F and E C, the plan of the four ribs contained in one quarter; X W, fig. C, is the height of the dome above the teaster, and becomes the same for every rib; X X is the length of the rib E C; the length of the rib E G, is shown in fig. D; the length and height of each are to be divided, as in fig. 3, and the intersecting lines will give points, through which the different curves may be traced as before. In groined teasters, where the ribs pass from corner to corner, the moulds may be obtained, after the same manner.

To find the outline of the face moulding for a raking pediment and its returning mitre.

A B, fig. 5, is the profile of the level moulding, C, the rake of the pediment. Divide the face of the moulding A B into any number of parts; in this case it is divided into four, and those equal; then from these points on the outline, draw lines parallel to the fillet A C, such as 3 3, 2 2 and 1 1; next draw the line D E on any part of the rake, and perpendicular to the line B F; then take the measure on the rake marked (4-0), and transfer it from 4 to 4, beyond the line E D; transfer the raking lines 3-4, 2-0, 1-0, on A B, to 3 3, 2 2, and 1-1, from the same line; then through these points of intersection 1, 2, 3, 4, the outline, making the face of the moulding, may be traced. For the return, or mitre of this moulding, if an open pediment as at C, raise a line on the lower fillet, perpendicular to the level moulding, as at F G. From the points 1, 2, 3, 4, in the level moulding at A B, draw lines parallel to B H, intersecting the perpendicular line B *i*, at 4, 3, &c. Next set the measures 4 4, 3 3, 2 2, 1 1, from the level moulding, on the raking lines 1, 2, 3, 4, from F G, as 4 4, 3 3, &c. through which points the outline (C F) may be drawn.

E

GEOMETRICAL FIGURES PLATE 4.

Fig 1

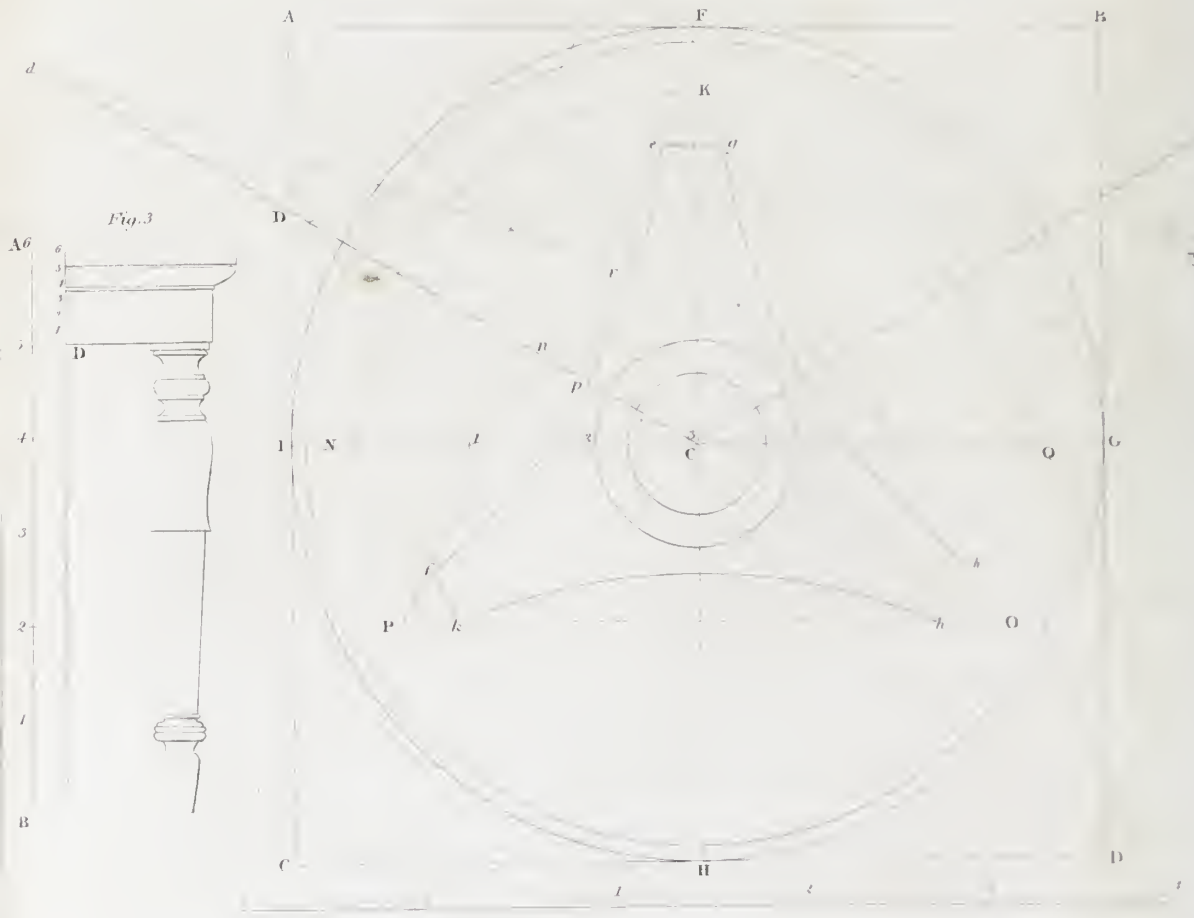


Fig.3

Fig 4

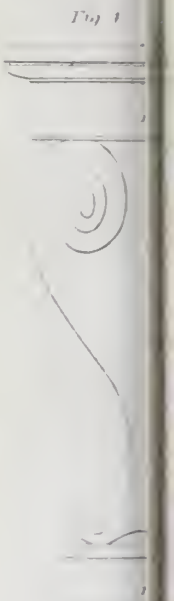
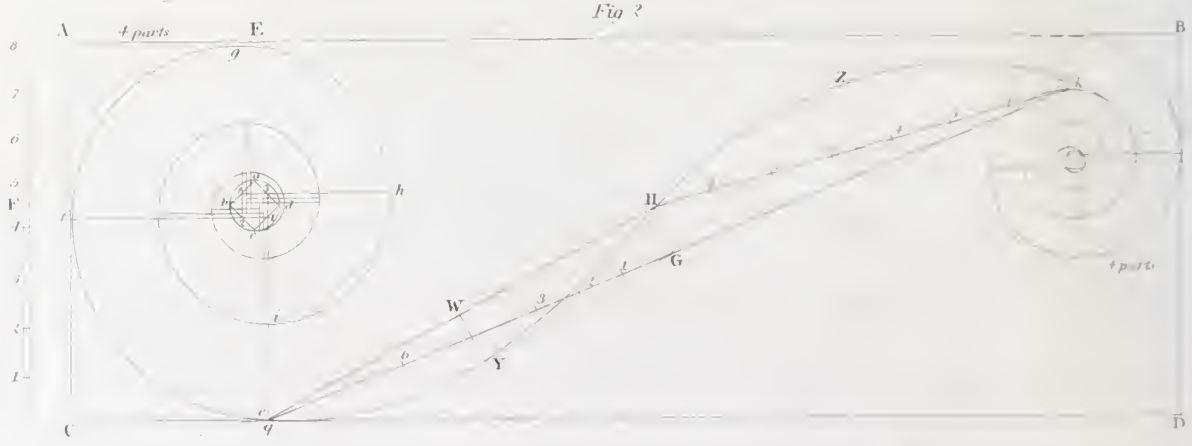


Fig 2



To find the face mould of a circular pediment.

Let A B, fig. 6, be the outline of the level moulding, which divide into four parts, as numbered; from these points describe arcs, parallel to the circular fillets B B and A A: then on B, No. 1, raise a perpendicular, cutting the upper fillet in C; and draw C D parallel to the line of the level moulding No. 1, which make equal to the projection at A; and from the divisions 1, 2, 3, 4, draw lines parallel to B C, until they intersect the line C D in the points *g, f, e:* next on any part of the pediment, as at No. 2, draw a line (B C) perpendicular to the curve, cutting the curve lines at *o o, o o,* from which draw tangents to each sweep, such as *o* A, *o* 3, *o* 2 and *o* 1. Make C D, No. 2, equal to C D, No. 1; C *e,* No. 2, equal to C *e,* No. 1, and so on for the other divisions, pointed out by the letters: from these points at No. 2, draw lines parallel to B C, and where they intersect the tangents, as at 1, 2, 3, 4, will give the outline for the face moulding.

GEOMETRICAL FIGURES, PLATE 4.

The diameter of a circular loo table being given to find the proportion of a triangular block, bearing the supports for the top.

Let I G, fig. 1, be the diameter of the top, and equal to four feet four inches taken from a scale of feet and inches; proceed and complete the square A B C D, within which from the centre C, describe the circle F G H I, which will then be the plan of the top. In a circular table of this diameter, namely, four feet four inches, the circle circumscribing a triangle of a fit proportion for the block, would require a radius of twenty-two and a half inches, which must be taken from the scale, of which only a portion is here shown by the dotted line K N P O. To form a triangle within this circle, divide the half diameter N C into three equal parts, as numbered from N to C; and form an equilateral triangle, equal to the whole diameter N Q, having its apex, or point, at E; from E draw the line E P through the first division, cutting the arc K N P O at P; from P draw a line parallel to the diameter, cutting the opposite portion of the arc at O; which line will become the length of one side

of the triangle, and by the scale be found to measure three feet three inches; next draw the lines K P and K O, which will complete the remaining sides of the triangle required. The width of the canted corners of the block under which the supports are placed being determined, such width must be set from the apex of each angle on the sides, as from P to *k*, and P to *f*, &c. Lines drawn from *k* to *f*, *h* to *h*, *e* to *g*, will give the three canted corners required, and which will be found to be one thirteenth part of the diameter of the top. To produce the curved line from angle to angle of each cant, bisect the line *f e* at *n*, and through this point draw a perpendicular to such line indefinite, passing through the centre C; then on this line, from *n*, set three inches by the scale for the depth of the sweep to *p*, and draw the line *p e*, which bisect also at *r*; and continue the line until it intersects C *n* at *d*, which will become the centre for striking the curve *e p f*; the distance of which, from the centre C, must be set off upon perpendiculars drawn through the centres of the other two sides.

Note, that the depth of the sweep (three inches), is equal to nearly one-seventeenth of the whole diameter of the top; but it may be made one-eighteenth or more, at pleasure. Remark, likewise, that the pillar, or support of the top, from the block, in its lower diameter, exclusive of its ornamental mouldings, must not exceed an eighth of the whole diameter of the top, and will, therefore, in this instance be six and a half inches.

This mode of proportion will hold good for all tables, either of a larger or smaller diameter, and reference may then be made to the rule of three, as mentioned in problem 19, relating to the occasional table.

To find the outline for a console or truss bracket, by means of proportional numbers.

This elegant support in the Corinthian entablature, having been adopted in some measure, as an ornamental support for pier tables, commodes, sideboards, &c. in household furniture, the mode of finding its outline may not, in this instance be deemed unacceptable.

In fig. 2, the console bears a proportion as regards the length to the height, as 1 to 3; that is, if the height be 1 foot the length would be 3.

Divide A C into eight equal parts, four of which set from A to E for the centre or eye of the volute; next bisect the division 4-5, on the height A C, as at F; through which draw a line intersecting another line dropped from E, (equal four parts), which will then be the centre for the eye of the volute: this being obtained, make the circle or eye equal to one division, and construct the lozenge square *a b c d:* bisect each side of this square; then begin with No. 1, and strike the arc *e f;* from No. 2, strike the arc *f g;* next, from No. 3, describe the arc *g h,* which gives the greatest width of the volute; and from No. 4, strike the arc *h i,* completing the fourth evolution: the remaining evolutions are gained by the inner divisions on the diagonal lines at 1, 2, 3 and 4, which process, may be seen more at large, in architectural works, describing the method for working the volute of the Ionic capital. For the smaller volute, divide the line B D into seven equal parts, and give four of these parts to the small volute for its height; which again divide into eight other parts as at X X, four of which set back from B; draw a line parallel to B D, on which line set four and a half parts from the top, for the centre of the eye, and proceed by the same principles as laid down for the larger volute. The two volutes being thus obtained, draw a right line from the bottom of the larger one at *e,* to the extremity of the fourth evolution in the smaller one at *k;* bisect this line, as at G, from which point raise a perpendicular at pleasure: divide the half of this line *e* G, into nine equal parts, and set back one of them from G to H; this determines the centre for the compound curve, making the belly of the console. Draw the lines *e* H and H *k,* bisecting each at V and W; and from these points draw perpendiculars. Make W Y equal to one-ninth of the line *e* G, and V Z equal to one-seventh of the line H *k;* the two curves, *e* Y H and H Z *k,* may then be drawn by hand, which will complete the outline of the console.

This system of proportion is applicable in making any working drawing from a design having this figure, where there is an opportunity of allowing a bold projection. Suppose the height allowed for the support of a table, having this contour or outline, to be thirty-one inches, the projection as A C, would then require to be ten inches and one-third; this would answer in open pier tables, but not so for inclosed commodes, for in such case it would be found necessary to make the volute of an eliptical form, in order to avoid too much projection. The elegant outline prevailing

amongst the best remains of antiquity, cannot be too attentively studied. It proves that the attainment of them was more the effort of study, than the effect of chance. It is to be observed, that the figure, as drawn here, exhibits the console as it is placed in the corinthian entablature; but, when reversed, makes the truss supporting our present moveables of taste and fashion

To find the proportion, the Top, the Mouldings, and Frieze of a Sideboard should bear to the whole height.

A B, fig. 3, represents the usual height of a sideboard; this height divide into six equal parts, and give one for the thickness of the Top, with the mouldings, and the frieze, as C D; next divide C D into six equal parts, and give one for the square of the Top, one and a half to the moulding under it, and the remainder for the frieze. This proportion answers for all sideboards, not having a plinth to support the legs.

To find the proportion, the Top, the Mouldings, Frieze, and Plinth with base moulding of a sideboard should bear to the whole height.

E F, fig. 4, is the given height of a sideboard having a plinth (F G) with mouldings, on which the supports would rest.

Divide E F into nine equal parts, and give one and a half of these parts as E H, to the Top, with the moulding and frieze. Divide E H into five equal parts, and give one for the square of the top, one for the moulding under it, and the remaining three parts will belong to the frieze. For the base, give one division E G, for its whole height, which again divide into four, and let one make the moulding, the remainder making the plinth.

Of Mathematical Instruments.

Having now brought the Geometry to a close, it remains to give a list of such mathematical instruments as are generally contained in the larger or smaller cases, confining ourselves, however, to a description of those only, whose utility is least known amongst Mechanics.

CONSTRUCTION OF SCALES &c.

Fig. 1.

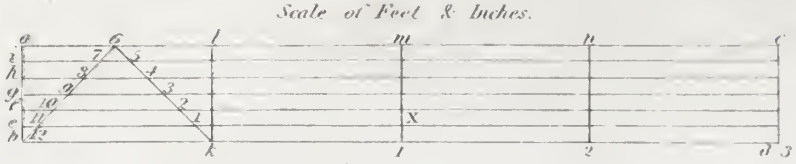
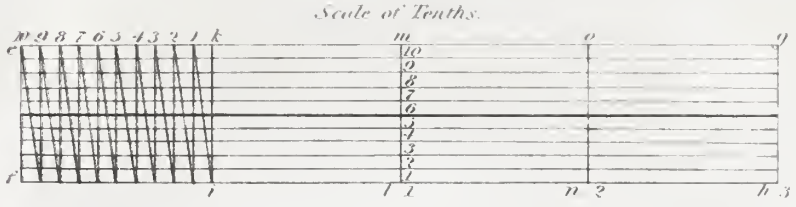


Fig. 2.



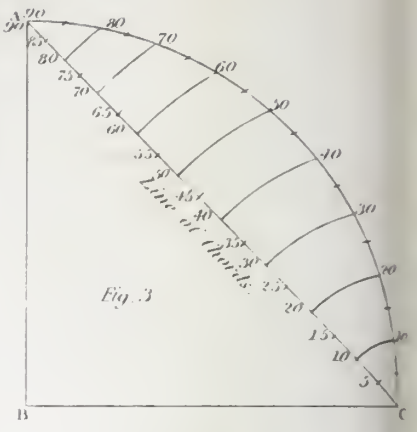
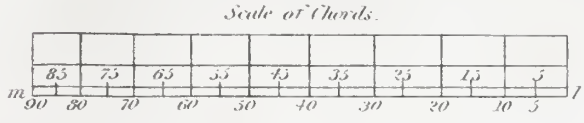
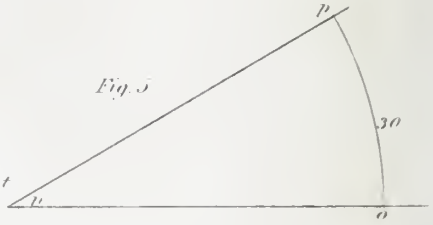
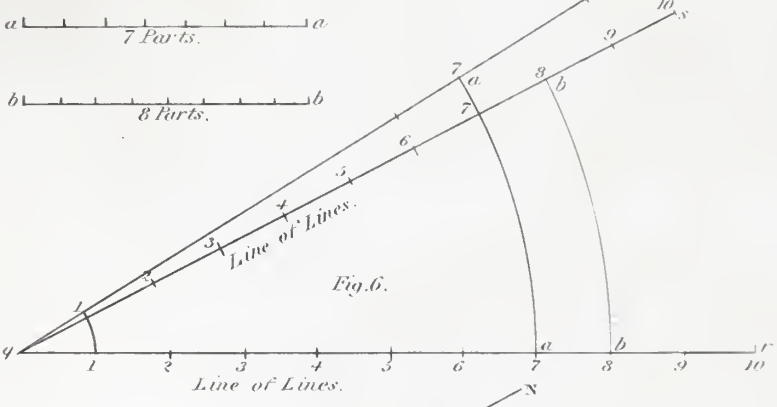
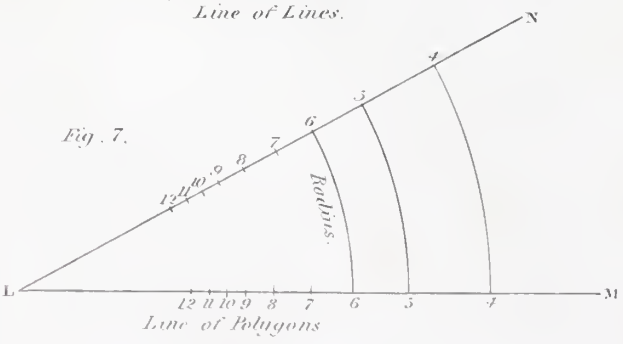


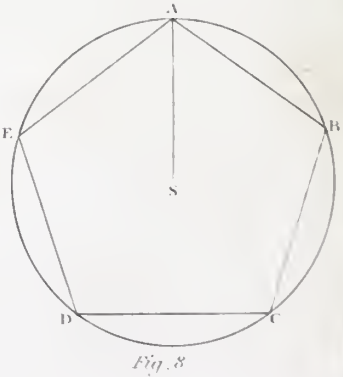
Fig. 4.

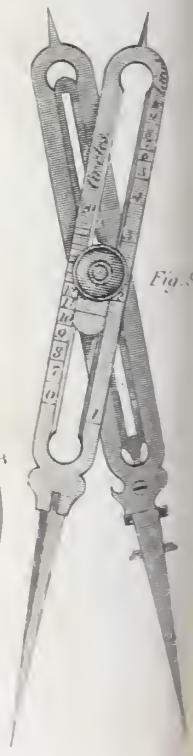












These cases contain, first, a pair of compasses, with a shifting leg; thus made, to allow the placing a brass drawing pen, or pencil, with its brass holder, in place of the shifting leg: a pair of plain compasses or dividers: the small bow compasses: the drawing pen, having a steel pointer that screws in and out of it: a brass semicircle or protractor: the ivory plain scale; a sector; and parallel ruler.

The compasses with the shifting leg are used in drawing circles and arches of larger dimensions than can be performed with the small bow compasses; as well as to admit of changing the brass pen for the pencil holder, as occasion may require. The drawing, or steel pen, is used for producing straight lines, by the edge of a ruler; the shaft, or handle, containing the steel pointer or pin, is useful in making a fine point or dot upon paper when wanted, and is used likewise in perspective, to fix at the vanishing points or point of sight, where many lines converge, and are required to be drawn.

The protractor is a semicircle of brass, divided into 180 degrees, and numbered each way 10°, 20°, 30°, &c. for the convenience of taking off the divisions; the external edge, or straight side of this instrument, is called the central line, and is chamfered down to the under side. The chief use of this instrument is to measure, or to lay down any angle required; see its application in Plate 4, fig. 3, of Geometry.

Construction of Scales, &c.

The scale of feet and inches, or plain scale, fig. 1.

This scale is used in making drawings of pieces of furniture, or other objects, that require to be drawn smaller than the objects themselves really are; or otherwise, for making a design on a small scale, that shall bear the same proportion in all its parts, as one on a larger; for instance, one scale may have its divisions (representing feet), each one inch in length; another may have it three quarters of an inch, another half an inch, and another one quarter of an inch; each of these divisions are supposed to be alike, and divided into twelve equal parts; therefore, by this scale it follows, that any object may be drawn to a larger or smaller size, and hold the same proportion.

To construct a scale of feet and inches.

Draw the line *a b*, fig. 1, on which set up six equal parts; from *b*, draw the line *b d*, at right angles to *a b*, on which set off as many equal divisions as you may think necessary; which divisions may represent feet, or any other certain measure; from the points *e f g h i a*, as marked on the line *a b*, draw lines parallel to *b d*, and raise the perpendiculars *k l*, 1 *m*, 2 *n*, *d c*, numbering them progressively from *k*: the division *b k* representing one foot, must be divided into twelve equal parts for the inches, after this manner; divide *a l* into two equal parts, as at 6, and draw the lines *b* 6 and *k* 6; by this means each half will be accurately divided into six equal parts, as numbered 1, 2, 3, 4, 5, 6, &c. In using this scale, if you require one foot one inch, set your compasses on the line above 1, as at X, and open them to 1 on the same line, in the inches; you will then have a measure equal to one foot one inch, and so on for every increase up to 6; and again for any measure beyond 6, extend the compasses to the points 7, 8, &c. marked on the line 6 *b*, until you finish at 12, making the foot.

The scale of tenths, and its construction, fig. 2.

Proceed and set up ten equal divisions on a perpendicular line *f e*, and through these draw lines, each parallel the one to the other; on the line *f h* set off any number of divisions you may require, which may represent feet or any other measure; from these raise perpendiculars, as *i k*, *l m*, *n o* and *h g*; next divide *e k* into ten equal parts, and drop a perpendicular from each; draw the inclined line 1 *i*, and lines from 2, 3, 4, 5, 6, 7, 8, 9 and 10 parallel to it: the parallelogram *f e k i*, will then be divided into 100 equal parts, called tenths or hundredths. The divisions *l n*, *n h*, may each be considered as a foot, an inch, or any other measure.

In using this scale, suppose you required a measure of five feet and five tenths of a foot, begin by placing your compasses on 6, in the line *l m* (which is the fifth division), and extend them to the fifth division on the same line in the parallelogram *f e k i*; you will then have the measure required. If the divi-

sions *i l, l n, n h* were inches, then the divisions in *f e k i*, would be the tenths or hundredth of such inch. It is, therefore, evident by this scale, that the foot, inch, or yard, may be divided into 100 or 1000 equal parts. This scale is found on the plain scale.

The scale of chords.

This scale is found on the sector, an instrument of ivory, its two limbs opening like the compasses, with corresponding divisions marked on each limb, and marked C. It will be found essentially useful in laying down angles of any number of degrees, as well as to divide a circle into any number of equal parts

To construct a scale of chords, fig. 3.

Draw a right line B C, and make the line B A perpendicular, or at right angles to it; make B C and B A each of equal measure, and draw the hypothenuse A C; this will then become the chord line, and is to be divided after the following manner;—on B, with the radius B C or B A, describe the arc A C; divide this arc into nine equal parts, which number from the first division over C, 10, 20, 30, and so on to 90; the segment, by this means, becomes divided into 90 degrees; each of which may again be subdivided for the halves. Proceed and set one foot of the compasses in C, and opening the other to the division 10, describe an arc cutting the line A C at ^{10}, this will then be the first division on the line of chords; in the same manner lay down all the other divisions from the segment, on to the chord line, and likewise for the half divisions, as numbered ^{5}, ^{15}, &c. &c. he whole line will then be properly divided.

Draw a right line *m l*, fig. 4, and from *l* set off the first measure on the line A C, fig. 3, above C; proceed and take all the remaining measures on A C, from C, and transfer them on the line *l m*, fig. 4, from *l*, until the whole are put down, you will then have a regular scale o. chords to work from.

APPLICATION.

Suppose an angle of 30 degrees is required to be laid down; take the measure 60 from the scale, in your compasses, which set from *n* to *o*, fig. 5; and on *n*, with this radius, describe an arc of a circle *o p*; next take the measure 30 from the scale, and placing the compasses in *o*, describe an arc intersecting the other at *p*, and draw *n p*; then will *p n o* be an angle of 30 degrees. The number of degrees contained in the side of any polygonal figure being given, the circle circumscribing it may, by this means, be accurately divided into as many equal parts as the figure contains sides, provided the radius of the circle equals the measure 60 taken from your scale; if an octagon having eight sides of 45 degrees each is required, take 45 from the scale, which line will then pass eight times round the circle, and so on for any other many sided figure.

Line of lines.

This line is also placed on the sector, and is denoted by the letter L on the end of each limb.

In fig. 6, *q r*, *q t* may represent the limbs, which are each equally divided into ten equal parts; its use is to divide any given line into an equal number of parts, and is thus performed. Let *a a* be a line that is to be divided into seven equal parts; take the measure of this line in the compasses, and setting one foot on the sector, fig. 6, at the division marked 7, open the other limb of the sector until the opposite point 7 coincides with the opening in your compasses, in which situation let the sector remain; then set one foot of the compasses on the division 1 on the sector, and close them until they meet at the opposite point 1; this measure will then be one-seventh of the line *a a*. If a line of the same length (*b b*) is required to be divided into eight parts, then with such length in the compasses, set one foot on the division marked 8, and open the sector until the compasses reach the opposite division marked 8, as before described in dividing for 7;

the opening at 1, 1 will be the measure required; in this way any right line may be divided by the sector.

The line polygons.

The division of this line is likewise to be found on the sector, and is denoted by the letters P O L; half on each limb, as shown in fig. 7, where the limbs, L M and L N are divided by the figures 4 to 12 marked on each limb.

To divide a circle A B C D E, fig. 8, into five parts, or to construct a Polygon, take the radius of the circle S A, fig. 8, in the compasses, and set one foot on the division marked 6 on the sector, and open it until the compasses touch the point 6 on the opposite limb; thus let the sector remain; next proceed and set one foot of the compasses on the division marked 5, and contract or open them until they reach the opposite point 5 on the instrument; this measure in the compasses will be the side of a pentagon, passing five times round the circle, at the points A B C D E, as shown in the figure: any division of the circle from 4 to 12 may be obtained by the same means. The Geometrical square may be constructed by the same process, for taking the measure 4, 4 from the sector, it will pass four times round the circle.

The proportional compasses.

These consist of two limbs or sides of brass lying flat on each other, and appearing as one piece when shut. These sides are made to turn or open upon a centre, moveable in a grove cut through the greatest part of their length; to this centre, on each limb is fixed a sliding piece of a short length, called an index, having a fine line drawn upon it to be set against other lines or divisions placed on one limb of the compasses, and sometimes on both. There are the line of lines, the line of circles, or otherwise polygons to be inscribed in circles, on one limb; and a line of superficies or areas, and a line of solids on the other; it is thought necessary here, only to show the side of that limb having the line of lines and of circles, as being the most essential to our present purpose. These lines are all unequally divided. The line of lines

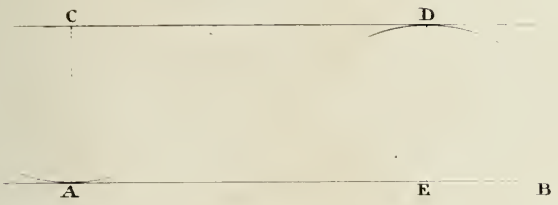
from 1 to 10, and the line of circles from 6 to 20. Their uses are as follow :—

By the line of lines, a given one may be divided into any number of equal parts, by placing the index against 1 and screwing it fast by the nut; if the compasses are opened, the distance between the points at each end will be equal. By placing the index against 2, and opening the compasses, the distance between the points of the longer legs will then be twice the distance between those of the shorter; and thus any line may be bisected or divided into two equal parts. If the index be placed against 3, and the compasses opened, the distances between the points will be as three to one, and thus a line is divided into three equal parts, and proceed in the same manner for any number of parts under ten.

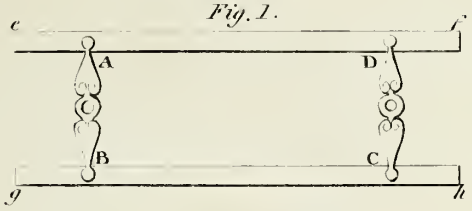
The numbers marked on the line of circles are the sides of polygons required to be inscribed in any given circle, or by which a circle may be divided into equal parts from six to twenty. Thus if the index be placed at 6, the points of the compasses at either end, when opened to the radius of a given circle, will contain a side of an hexagon, or divide the circle into six equal parts. If the index be placed against 7, and the compasses opened so that the longest points be equal to the radius of the circle, then the shorter points will divide the circle into seven equal parts, or measure the side of an heptagon; again by placing the index at 8, and opening the compasses, the longest points will contain the radius, and the shortest points divide the circle in eight equal parts, and inscribe an octagon; the same method must be made use of to obtain any other polygonal figure. The line of superficies, and line of solids being only of use in the higher branches of mathematics, renders the description of them useless in this place, and for which reason, the compasses are shown in the plate with the lines marked only on one side.

The parallel ruler has been fully described with its use in Problem 16, Plate 11, Figure 1.

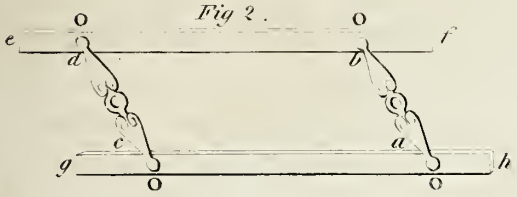
Prob. 16.



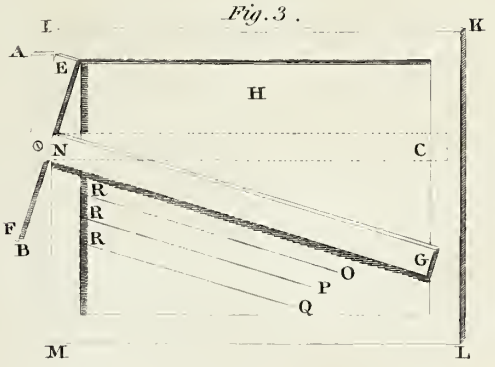
Application.
Fig. 1.



Application.
Fig 2.

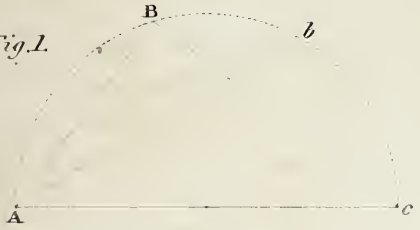


Application.
Fig. 3.

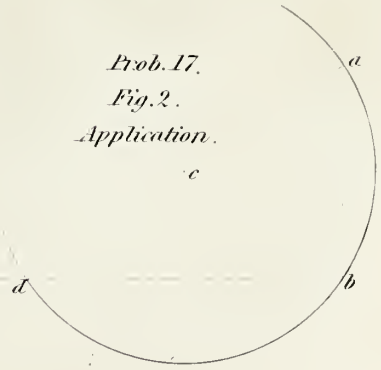


Prob. 17.

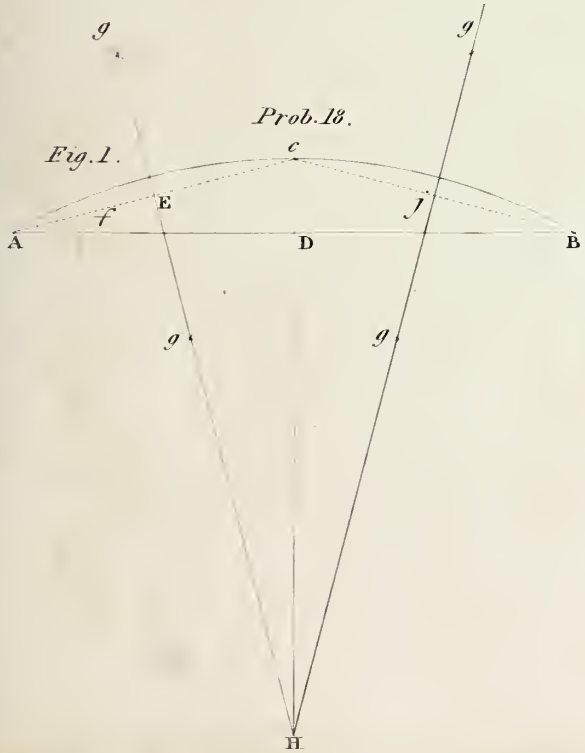
Fig. 1.



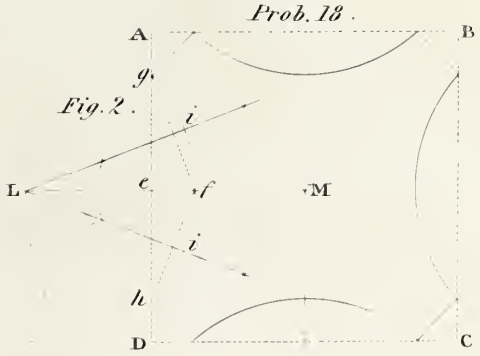
Prob. 17.
Fig. 2.
Application.



Prob. 18.
Fig. 1.



Prob. 18.
Fig. 2.



Application.

PERSPECTIVE.

INTRODUCTION.

Perspective is the science or art of projecting all objects on a plane surface, giving them the appearance of reality, or as they would appear to the eye of a spectator, placed at a certain distance, and in a certain position in regard to the object; and that by the aid of lines.

Perspective may be regarded as the offspring of Geometry; the principles on which it is founded being contained in the first, third, sixth and eleventh Books of Euclid; containing the doctrine of angles, circles, proportion and planes. This science may be classed or comprehended under two heads, namely, Theoretical and Practical; the first of which, demonstrates the nature and truth of its propositions; the second, applying them to practice. It may likewise be divided into rectilinear and curvilinear, either parallel or inclined. The study of it is entertaining as well as useful, and of considerable importance to the painter, and much more so to the architect and mechanic. To understand it theoretically, requires an intimate acquaintance with Geometry and Mathematics; but the practical part may be attained with a slight knowledge of Euclid's Elements; in which case the retention of its rules laid down, will depend entirely on the strength of memory and continued practice. As the body acquires strength by the exertion of its powers, so it is with the faculties of the mind: the inquisitive student will not be satisfied but by demonstration, in which case he must have recourse to the theory; while others will rest contented with a knowledge of its rules by rote, taking them for granted, as they are laid down. In a work like the present, it is not our intention to enter into that part constituting the theory; which would require an education, and a mind fitted for such a course of study: we shall therefore confine ourselves to the practical part alone,

and consider it more as an art than a science without omitting to mention and account for, in a familiar way as occasion may require, that which otherwise would belong to the theory. Neither is it intended to write a treatise for those conversant in mathematical knowledge, to confute opinions, or to improve a science so ably treated on, and brought to perfection by others. Our only aim will be that of detailing information in plain and familiar terms, endeavouring to reduce a science, that has hitherto been considered difficult of attainment, easy in comprehension. All material objects become perceptible to us by rays of light continually passing in right lines from all parts of them, entering the pupil of the eye; and diverging under the same angle until they are seated on the retina, a membrane or net work covering the back part of it, and in a reversed position. How this impression is again conveyed to the sensorium or brain, giving it its original representation, has eluded the researches and reasoning faculties of the most scientific men; every thing already advanced amounting only to conjecture. Those who may be desirous of entering into the nature of vision, applicable to this subject, may consult the works of Newton, Simpson, Brook Taylor, Hamilton, Malton, &c., where they will find the whole amply treated of and largely explained.

The science of Perspective has been ably and powerfully handled by learned men of almost all countries; but particularly so in Italy, Germany, France, England and Holland. To render the subject as clear as possible to those unacquainted with other branches of science, we shall in this place have recourse to the same system pursued by us in treating on Geometry; beginning our course with as many definitions as are necessary to a right understanding of all the terms used in this amusing and useful department of art: we shall therefore proceed in the first place, to define the *point* in all its various acceptations; in the next, explain all the properties attached to lines; and in the third and last place, define the nature and doctrine of planes; a very careful reading of which is strongly recommended previous to entering on the practice; as tending very materially to lessen the difficulties that present themselves to the student in the commencement of this study; and make that a matter of ease, which otherwise would be considered as one of difficulty. In our progress every pains will be taken to render the subject clear and familiar to the understanding, accompanied at the same time with such dia-

grams and remarks as are applicable and tend to the purpose. It would be possible to have written extensively on this our present subject; but as our purpose is not to write so much for the initiated in science, or the clearing up of difficulties with the mathematician, as for the information of the untaught, it would become foreign to the present purpose, and rendered in this treatise unnecessary; a great deal of the science being more a matter of speculation than positive use. Those who wish to enter fully into the theory may consult the works of Dr. Brook Taylor, Hamilton and Malton.

In order to a right understanding of the true principles of this art, all objects about to be represented should be considered as placed behind the picture or any transparent plane, such as glass; through which a distinct view of the object on the other side would present itself to the eye of the spectator: in this case it is evident that by keeping the eye steadily fixed to one point, such object or objects may be faithfully traced by the hand on the transparent plane: this, the rules of perspective enable us to realize by the aid of lines.

The true principles of this art were very little known in this country, until taken up in a very scientific manner by Dr. Brook Taylor; who is supposed to have drawn his principles from a work written by one Guido Ubaldi, and printed at Pesaro, in the beginning of the fifteenth century; who first discovered that all lines parallel to each other, but inclined to the plane of the picture, would converge to some point in the horizontal line; such point being gained by imagining a plane to pass from the eye of the spectator parallel to the side of an original object, until it cuts the picture. These principles have since been greatly improved upon by subsequent writers.

Having said thus much as to its use in general, we shall now say something how far it can be useful to those mechanics to whom our treatise is addressed. To these the knowledge of Perspective is of the greatest importance, enabling them to show by a slight but spirited sketch, a model of the article they design to make. In taking orders, they will find in this, a real advantage over others that have not the same acquirement. That the subject has hitherto been too mathematically treated is well known, but no fault can be attributed to those who have written on it; as few or none have thought it worth their while to treat it in a manner fitted to the comprehension of humble capacities. A great advantage also arises

from a knowledge of this art, insomuch that any design can be made and forwarded into distant parts, either at home or abroad, and have the same effect as would be produced by a model. The master Cabinet-maker, or foreman, should on no account be uninformed in this science, or neglect advantaging themselves by it: they can convey their ideas better to the artizan by a true perspective sketch in many instances than by lines; and for the same reason the workman should not be deficient, as in this instance he would he would more readily enter into the designs of his employer. If therefore our explanations do not abound with technicals, but are confined to plain and simple terms, it is so done to render the matter clear to the student. Thus much for introduction; a considerable deal more remains to be said; but will come in with better effect, and more to the purpose, in defining singly the three essential parts constituting the whole art of Perspective; namely, Points, Lines and Planes. The greatest defect in all books written on this subject has arisen from placing several diagrams on the same sheet; the consequence has been a crossing or mixture of lines, quite sufficient to terrify any but a hardened student from entering into the subject; much less to follow references so intermingled with those of another object. Our plan will be different, giving the diagrams singly as the only means of avoiding confusion. It remains now to commence with the definitions, and this we shall first do as regards the Points.

PERSPECTIVE, Plate A.

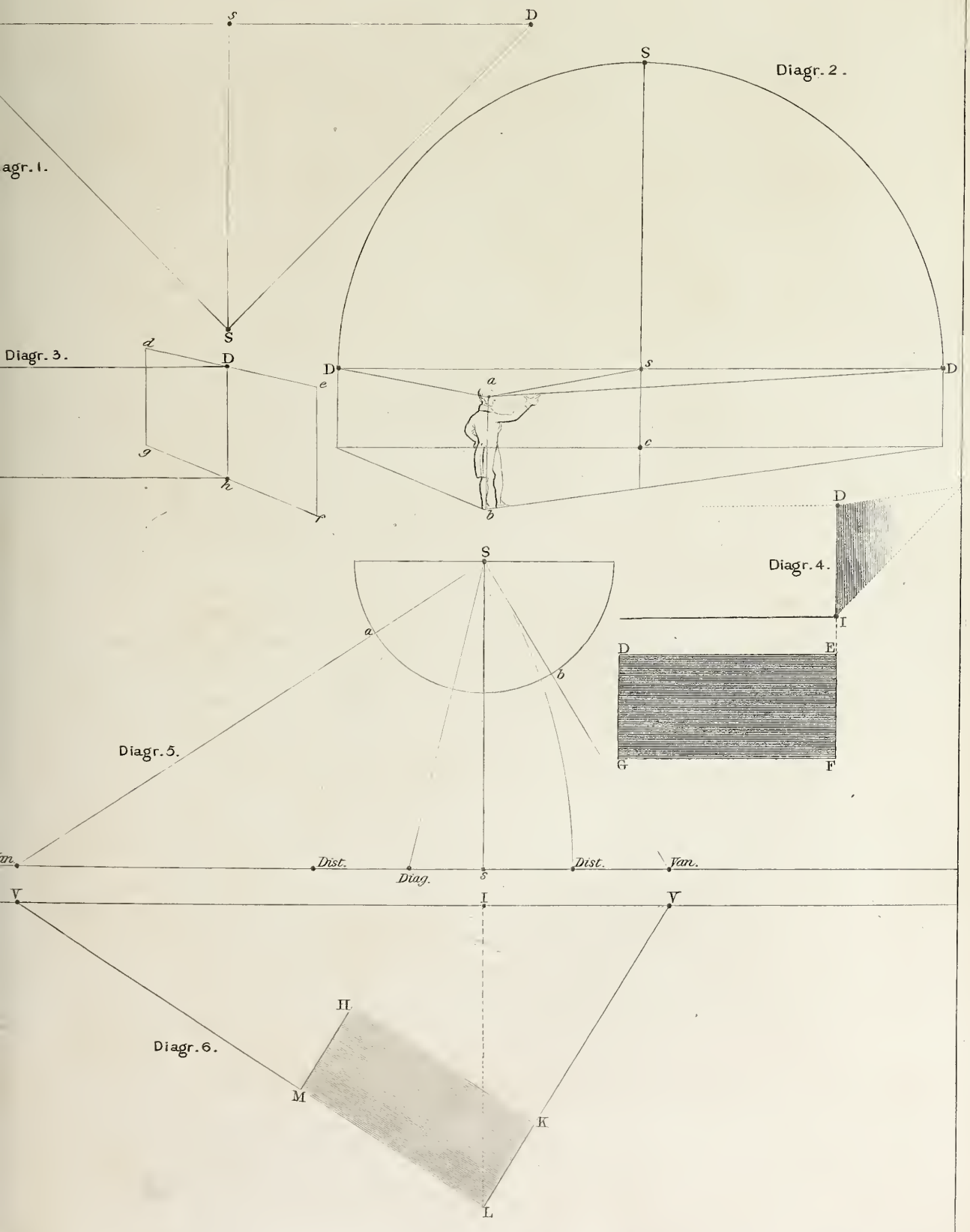
DEFINITIONS.

Points.

Point of Sight—Is that point imagined to pass from the eye of the spectator, in a direct line, and at right angles to any transparent plane, placed between him and the object; intersecting such plane in the horizon: such is the point *s*, Plate 1, Diagram 1: also *s* in Diagram 2, and D in Diagram 3, where *d e f g* may be considered as the transparent plane, and *d e* the horizon. This point is commonly called the centre of the picture, because the spectator's view is equally extended right and left of it.

PERSPECTIVE. A.

DEFINITIONS.



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Station Point—Is a point on the ground plane, generated by a perpendicular line dropt from the eye of a spectator to his foot; such is S, in Diagram 1, where the line D D may be considered as the site of the transparent plane, and *s* the point of sight as explained above. Also G in Diagram 3, where the point is shown as dropped from the spectator's eye to his foot.

Point of Distance—Is a point placed on the horizontal line right or left from the point of sight, denoting the distance from the spectator to the centre of the picture or transparent plane: such is S *s*, Diagram 1, placed from *s* to D, right and left: *s* D, Diagram 2, and S D, Diagram 3, where each represents the space from the spectator to the plane of the picture.

Directing Point—Is a point generated by a line passing direct from the side of any original figure, and intersecting the plane of the picture on the ground. D E F G, (Diagram 4,) and H K L M, (Diagram 6,) are both original figures, with the line of the picture, placed above each of them; in such case a line supposed to pass from the side E F, (Diagram 4), and the angular point L, (Diagram 6,) would intersect each of these lines at the points I and I; such points would become directing points. A perpendicular line raised from either of these points would constitute what is called the Geometrical line; as D I, (Diagram 4).

Vanishing Point—Is a point passing in a direct line from the eye of the spectator, parallel to any side of an original figure, and intersecting the plane of the picture in the horizon. In Diagram 6, V, V, are the vanishing points of the sides L K and L M; M H and H K, of the original figure H K L M.

In Diagram 5, *s* represents the station point, and S its distance set up from the horizon. *Van, Van,* are the vanishing points of the sides L K and L M, of the figure in Diagram 6. *Dist, Dist,* denote the points of distance for the same sides, and which points are the distances from L to V on each side of the figure, set off from the vanishing points in Diagram 5, as shown by the arcs.

Diagonal Point—Is a point imagined to pass from the eye of the spectator in a direct line, and cut by the plane of the picture; such line bisecting an angle of 90 degrees, supposing the eye of the spectator to be the vertex.

In Parallel perspective the Point of Distance serves as a diagonal point, because it passes in a line from the eye of the spectator at an angle of 45 degrees. This point is used for obtaining the mitre lines for all right angled figures in perspective, whether parallel or inclined to the Picture; D *iag*, in Diagram 5, denotes the Diagonal point, bisecting the right angle *a* S *b*.

Having defined the different points made use of in Perspective, and illustrated them by Diagrams; the definition of Lines and Planes falls the next under consideration. In perspective there are six lines chiefly to be considered; namely, the Ground line, the Horizontal line, the Vertical line, the Original line, the Station, and the Vanishing line.

Ground or Base Line—is a right line passing under the foot of a spectator, and drawn parallel in every respect to his horizon, or the line passing through his eye: it denotes that part of the surface upon which he is supposed to be stationed, when looking at any object; such is the line C D, fig. 1, Plate B.

On this line all Geometrical or known measures are usually placed.

Horizontal Line—is a perfect level line passing through the eye of the spectator and bounding his view on every side: it is that line or circle where the heavens and the earth appear to meet. A B, fig. 1, Plate B, is the Horizontal line of the spectator standing on the ground line C D.

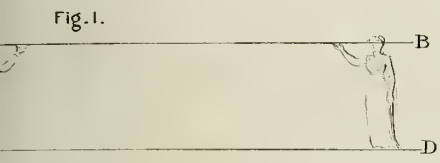
This is considered the principal line in perspective delineation; as regulating from its fixed and determined position, all other vanishing lines; we shall, therefore, on this account, be more particular in explaining it; the proper understanding of which will very much assist the student in comprehending the doctrine of planes; a subject which has hitherto passed as a matter of difficulty.

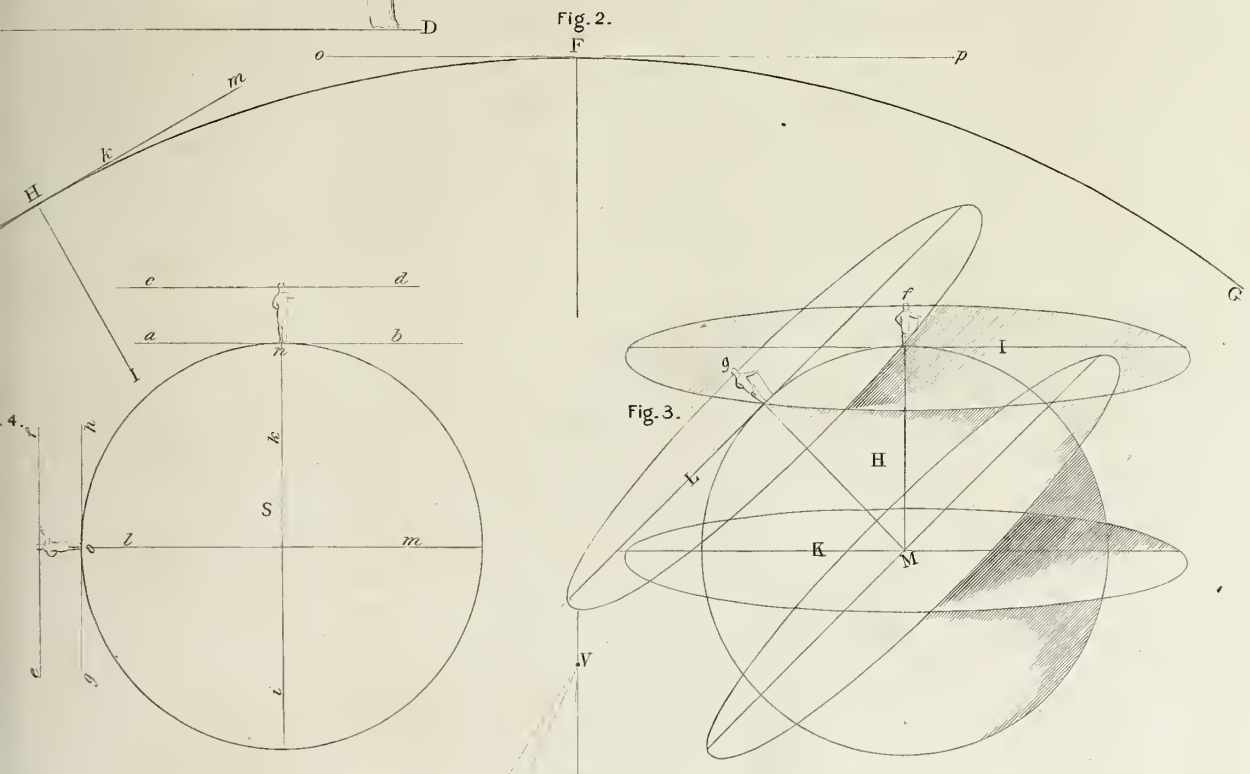
It may in the first place be necessary to inform the reader that, from the convexity of the earth's surface, every point or place on it will have a different horizon, in regard to a spectator stationed on it.

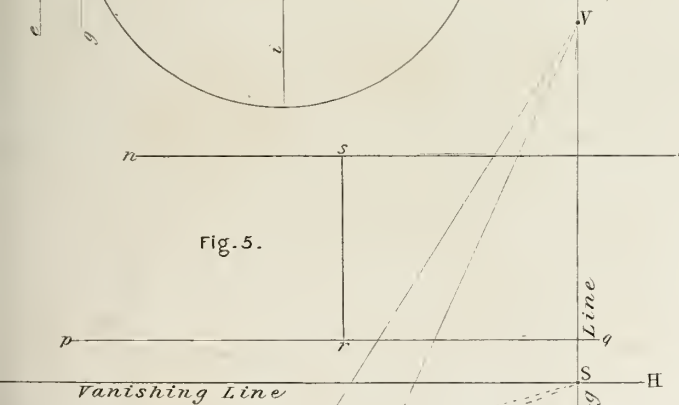
Let E F G, fig. 2, represent an arc or portion of the earth's surface, drawn on as large a scale as the limits of the paper will admit: the space from F to H may be considered as one meridian or twelfth part of its circumference, containing 30 degrees or 2085 English miles. If a spectator be stationed at H, a tangent *l m*, drawn through this point will be his horizon: if placed at F, *o p* will then become his horizon: a line drawn

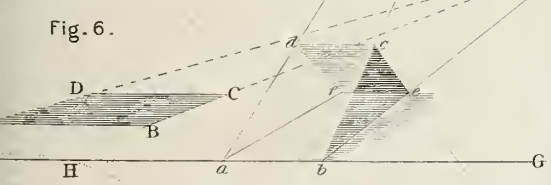
PERSPECTIVE: B.

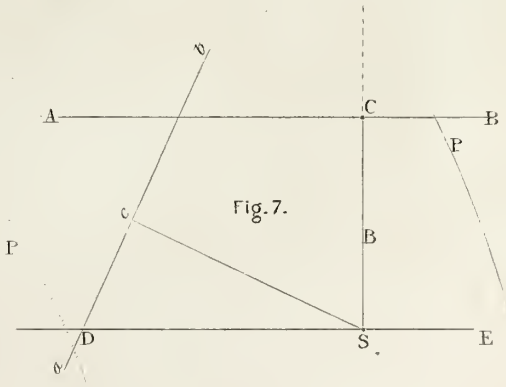
DEFINITIONS.

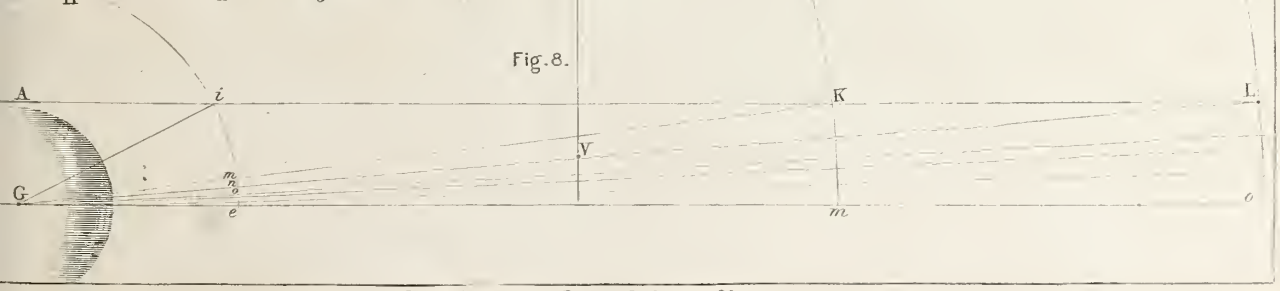












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at right angles to any one of these tangents, would pass through the centre of the earth, and consequently become the centre of gravity to such spectator. Suppose the spaces *i* H and H *k*, each to represent the eighth part of this meridional space; they will each measure the eighth part of 30 degrees, or 260 miles and 5 furlongs. Now although this space of ground is literally a curved line, the angle made by the tangent or level line *l m*, passing through H, is so small in this number of miles as to make the segment imperceptible, and appear to a spectator travelling over the whole, or a part of it, a straight line. If therefore the earth's curvature is imperceptible even in 260 miles, it must be less so in a smaller portion, so that a traveller continually walking over its surface, would find himself everywhere on a level, and for this reason his horizon would be a straight line.

The Horizon is either Sensible, Rational, or Visible. The Sensible Horizon is a circle, the plane of which is supposed to touch the spherical surface of the earth in the place of the spectator, whose horizon it is, and from thence continued to the sphere of the heavens: thus in fig. 3, if I imagine myself placed at *f*, and the ground on which I stand to be extended every way until it reaches the sphere of the heavens, as shown in the figure by the perspective circle I; this plane becomes my Sensible horizon: if I travel onward to *g*, my Sensible horizon will be the circle L.

The Rational Horizon is a circle whose plane passes through the centre of the earth, parallel to the sensible horizon, and continued to the heavens: the circle K is the Rational Horizon of the figure placed at *f*, likewise the circle M becomes the Rational Horizon of the figure at *(g)*. The earth is so small in comparison to the magnitude of the sphere of the heavens, that the planes of the sensible and rational horizon coincide; that is, the distance betwixt them, when measured in the sphere of the heavens is insensible; not great enough to be discovered by observation. We may, for the sake of comparison imagine the circle H, which in this diagram represents the figure of the earth, to represent the sphere of the heavens; in which case the earth would be no larger than the point M, and consequently the distance between both horizons would be insensible, being denoted only by a single line.

To illustrate the coincidence between the sensible and rational horizons, still farther, we have thought proper to introduce a diagram, taken from an eminent writer on Astronomy, explaining it nearly in his own words. Let

G, in Fig. 8, represent the earth, and H, the sphere of the heavens. If an inhabitant of the earth stand on the point A, his sensible horizon is A L and his rational horizon *h o*; the distance between these two planes is G A, (equal the semidiameter of the earth) which is measured in a great circle of the sphere of the heaven, by the angle *i* G *e*, or by the arc *i e*. This arc in so small a circle as H *i*, &c. would amount to several degrees, and consequently the difference between the two horizons would be great enough to be discovered by observation. But this circle H *i e*, representing the sphere of the heaven is too small in proportion to that, representing the magnitude of the earth. Now let the sphere of the heaven be represented by the larger circle P K *m*, &c.; here the semidiameter of the earth G A, measured in this circle, would amount to fewer degrees: for the arc K *m*, measures a less number of degrees in the circle P K *m*, than does *i e*, in the circle H *i e*, &c. thereby making the angle K G *m*, less than the angle *i* G *e*. But this angle may amount also to many degrees or minutes, and consequently be large enough to be measured by observation. If we imagine the sphere of the heaven to be still larger in proportion to the globe of the earth, so that the half of it may be represented by a semicircle of which P L is a portion, the distance between the planes of the sensible and rational horizons, as measured by the angle L G *o*, or by the arc L *o*, is less, as containing fewer degrees than in the last supposition; but may still be large enough to be observed. From a view of this scheme, it appears that the larger the circle representing the sphere of the heaven, is, in proportion to the globe of the earth, the less sensible will be the difference between the sensible and rational horizon; as being measured by less angle. We may suppose the sphere of the heaven so large, that the angle which should measure the distance of the sensible from the rational horizon would amount only to a few minutes, or perhaps not so much as one second of a minute, and consequently too small to be measured. This in fact is the case, as mentioned in the Diagram, Fig. 3; therefore the difference between the two horizons is insensible: just as it would be if the earth was a point of no sensible magnitude.

The Visible Horizon is a circle, or plane, passing through the spectator's eye, parallel to his sensible and rational horizons. This in perspective is commonly called the Horizontal line, in which all lines situate on the ground plane, or any plane parallel to it, appear to vanish and become imperceptible.

Suppose the circle S, fig. 4, to represent the earth; if a spectator be stationed at *n*, the line *c d* passing through his eye would be his Visible Horizon; *a b* his Sensible, and *l m* his Rational Horizon. The same applies to the figure placed at R, as denoted by the lines *e f*, &c. Thus much in explanation of the Horizontal line.

Vertical Line; this is a right line drawn from the spectator's eye to his foot, and at right angles with the Horizontal and Ground lines, dividing the picture into two equal parts; it is commonly called the central line of the picture. In fig. 5, *n o*, represents the Horizontal line, *p q*, the Ground line; a line *r s*, drawn perpendicular to these, through the centre of the picture, would become a Vertical line.

Vanishing Line—If a plane be imagined to pass through the eye, parallel to the ground plane or to any plane perpendicular or inclined to it, and continued to the picture, it will by its section thereon, generate a line. This line so produced is called a Vanishing line.

The Horizontal is the Vanishing line for all lines and planes that are parallel to the ground, situate either on or above it.

The Horizontal Line, H H, Fig. 6, is the Vanishing line, for the plane A B C D, because this plane being seated on the ground, there converges in a point, from hence called its vanishing point; likewise the Vertical line V V, would become the Vanishing line for the inclined planes, *a b c d*, and *c d e f*; V V, their vanishing points being there seated.

Station Line—Is a line drawn from the foot of the spectator and continued to the plane of the picture, cutting it at right angles: it is generated by the intersection of the Vertical with the Ground plane. This line produces the point of sight or centre of the picture. Suppose; D E, Fig. 7, to be the Ground line; A B, the line of the picture; the point S produced to C would generate a line; this line so produced is called the Station line. If the picture be placed before the spectator at S, in the inclined position *m b*; S *c*, would then become the Station line.

Planes.

A Plane in perspective is an imaginary surface, perfectly even in itself; and bounded either by strait lines or circles. See this also explained in Geometry, page 10.

The picture in Perspective is always considered as a plane. If you suppose a square of glass to be placed between the spectator and an object, and through which he views it; this would be called the plane of his picture. Likewise the board or canvas upon which any subject is drawn may be called the plane of the picture.

A plane may be of any figure, and is always imagined to be infinitely extended.

In the practice of Perspective, the understanding of imaginary planes is of considerable importance; since the boundaries of all solid bodies, whether rectilineal or curvilineal, constitute planes.

There are in Perspective five elementary planes necessary to be understood: viz.

1. Plane of the Picture—which is always supposed to be perfectly upright, and placed at any distance between the spectator and the object; intersecting the Horizontal and Ground planes at right angles. This plane is always considered transparent, inasmuch as all rays from the object to the eye of the spectator, are supposed to pass through it, forming thereon the perspective representation of that figure.

2. Ground Plane, which is always considered as perfectly level and parallel in every respect to the Horizontal plane: such is the floor or ground on which we stand.

3. Horizontal Plane. This is a plane imagined to pass through the eye of the spectator, extending itself to the remotest Line* of vision, and being in every respect parallel to the ground plane, it becomes the vanishing plane for all objects standing perpendicular on that plane; whether they be rectilinear or curvilinear, parallel or inclined to the picture.

4. Directing Plane—is a plane perfectly upright; imagined to pass through the eye of the spectator, right and left, parallel to the plane of the picture; and at right angles with the Ground plane. In this plane all the geometrical heights of objects are supposed to be seated.

* In this line, which terminates the plane of the horizon apparently to the eye, the vanishing points of all objects, bounded by horizontal and vertical planes are supposed to be seated, and where the objects themselves would appear to vanish and become invisible.

This applies to vertical as well as horizontal planes, the height of one diminishing with the breadth of the other, in proportion as they recede from the eye and approach this line.

PERSPECTIVE. C

DEFINITIONS

Fig. 9

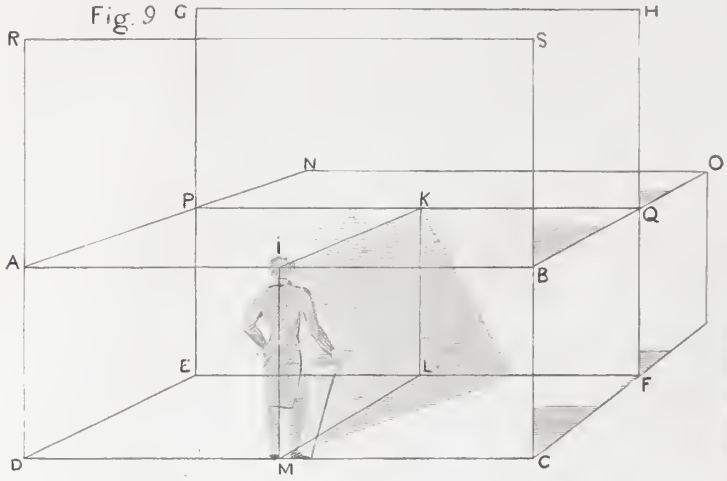


Fig. 10

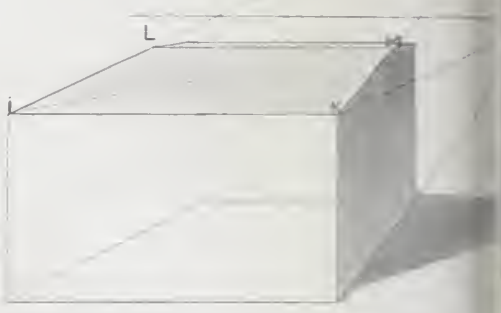


Fig. 11

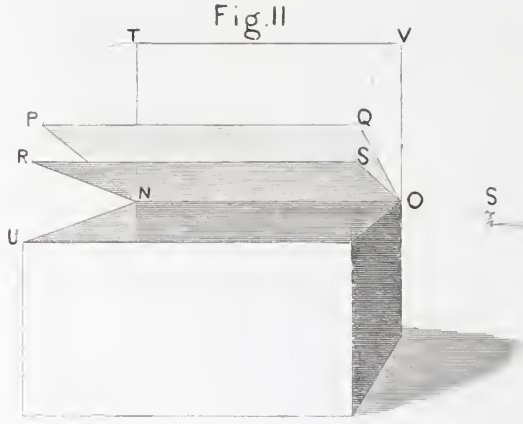


Fig. 14

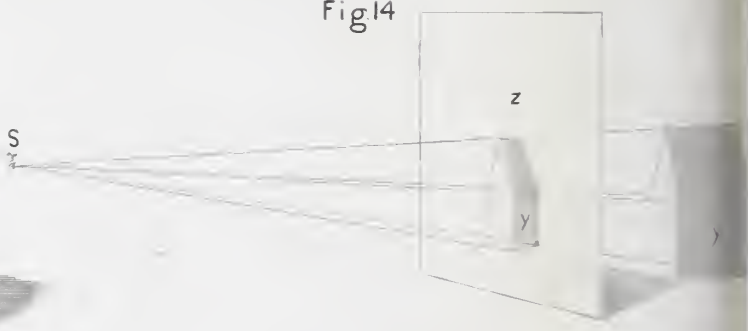
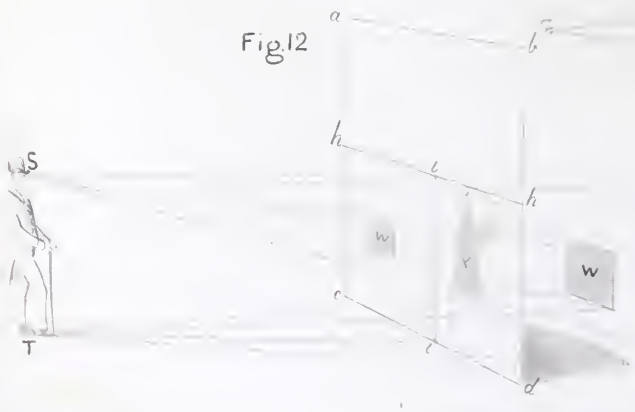


Fig. 15

Fig. 12



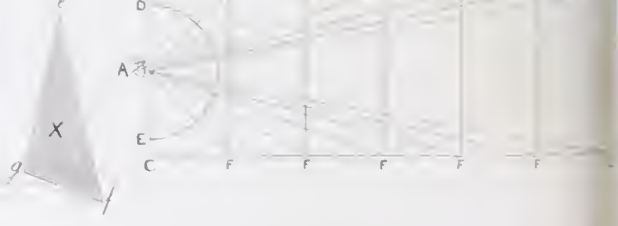


Fig. 13

5. Vertical Plane. This plane is also perfectly upright, and imagined to pass from the spectator's eye, cutting the picture, and the three other planes, at right angles.

All planes, standing perpendicular to the ground plane, become vertical planes; and may be placed in any position with respect to each other, either parallel, perpendicular, or inclined. The vanishing points of all objects in the horizontal line are generated by these planes.

EXAMPLES.

1. G H E F; (figure 9, plate C,) represents the Plane of the Picture; being the plane through which the spectator, (stationed in the directing plane, R S D C,) would view the object.

2. D E F C; in the same figure represents the Ground plane; because it passes under the foot of the spectator at M; and is parallel to the horizontal plane A N O B.

3. A B N O; denotes the Horizontal or vanishing plane; as passing through the spectator's eye at I, and by its intersection with the picture at P Q, producing what is called the Horizontal line. (See also definition of lines page 4.)

4. R S C D; represents the Directing Plane, as passing through the spectator's eye, and parallel to the Plane of the Picture G H E F.

5. I K L M; denotes the Vertical Plane; called likewise direct, as passing immediately from the spectator's eye, and continued to the plane of the picture, cutting it and the three other planes at right angles.

Besides these already mentioned, there are others called inclined planes; which are neither parallel nor inclined to the Picture: such are the sloping tops of desks; the revolving frames of Cheval dressing glasses; the inclined roofs of houses, &c. These would vanish in a plane perpendicular to the horizon, or otherwise into a vertical plane.

EXAMPLES.

Fig. 10, represents a desk, the top of which I K L M, forms an inclined plane, vanishing into the vertical line V S. It may also be considered as the folding flap of a writing table.

Fig. 11, represents a box, with the lid or cover as turning on its hinges or centre N O, generating thereby a plane, taking the form of a quadrant, as denoted by the letters T P R U. According as the top is more or less raised, so it would generate various inclined planes; as shown by the letters P Q N O, and R S N O.

Visual Rays—are right lines drawn from the angular corners or extremities of an object, to the spectator's eye; cutting the plane of the picture, and forming thereon its image or perspective representation. Example: X and W, (Fig. 12), are original objects, seen through the transparent plane *a b c d*, by the spectator stationed at S T. Lines drawn from the base and apex of the pyramid X, as also from the square W, to the spectator's eye at S, are visual rays. These rays produce the representation of the original objects, X and W, on the plane of the picture *a b c d*, which are denoted by *x* and *w*; *h h*, making the Horizontal line; *c d*, the Ground line, and *i i*, the Vertical line.

The appearances of all objects are conveyed to the eye by means of visual rays. The nearer any object is brought to the eye, the larger it will appear; the further it is placed from the eye, the less it will appear; making the angle more or less extended in proportion to its distance. This is shewn in the diagram Fig. 13—where the line F F, by the visuals makes a larger angle than the line B C, as measured on the semicircle D E. The other lines marked F F, F F, &c. each show the variation of the angle, as they recede more or less from the eye.

Pyramid of Rays—are visuals drawn from every extreme point of a rectilineal solid to the eye; thereby forming a solid angle, composed of several plane angles; making together the form of a Pyramid: such are the rays drawn from the several extremities of the object *y*, Fig. 14, to the eye at S, making a similar figure *(y)* on the plane Z.

Cone of Rays—are visuals or right lines drawn from any globular or cylindrical object; so called from the rays passing from each extreme or tangent of its surface towards the eye, and forming thereby a figure resembling a cone: as is shown by Fig. 15.

PRACTICAL PERSPECTIVE.

Previous to commencing the practical part of perspective, it may perhaps be necessary in this place to furnish a few observations, accompanied with certain rules, as regards the position of the picture, and the distance the most advisable to be removed from it, so that the object shall appear to the eye under the most agreeable and natural point of view.

There is a difference between the original object and its perspective representation, although the one is often mistaken for the other. If we wish to see an object in its truest and most natural form, we must place ourselves in a line parallel to the front of it, or in other words directly facing it; for the image formed on the retina (a net work covering the bottom or back part of the eye,) from this position, will approach the nearest in similarity to that of the object under view; and according as this position is more or less in a parallel line to the object we contemplate, so the idea of its figure will be conveyed more or less perfect to our senses.

As the appearance of an object to the spectator's eye is formed on the retina, so its perspective representation would be drawn on the plane of the picture, and its appearance will depend on the position of this plane; which position may be infinitely varied.

In reference to the shape and size of the picture no determined rule can he laid down, as this is always at the discretion of the artist, and regulated according to the extent of his view, and the number of objects to be introduced; the oblong rectangle is in most cases selected, as being

of a more agreeable and pleasing proportion than the square; such proportion being as 3 to 2; that is, if the length be 3 feet, the width would be 2 feet, or otherwise as occasion may require. Some objects whose altitude is great, as church towers, columns, &c. require it in an upright position; whilst others, such as oblong figures, buildings, &c. require it more generally lengthways. With regard to the height of the eye, and consequently the height of the horizontal line, this also must be regulated according as circumstances may require. In general it is placed equal to the height of the spectator's eye, which never exceeds 5 feet, or 5 feet 6 inches from the ground, as in most cases he is supposed to be standing on the Ground Plane. In many instances, it is necessary to adopt or make use of a low Horizon, when we would see the under side of some objects, or projecting members of others more distinctly; such, for instance, as the inside of beds, the soffits of cornices in low rooms, &c. The low Horizon is to be preferred in drawing of any article of furniture, and may judiciously be reduced to 4 feet, particularly in the representation of chairs, sofas, &c. as the high horizon would produce a distorted appearance in the seats.

It must not be taken for granted that any position or distance of the picture, with regard to the spectator and the object is alike suitable; perspective representations become distorted by placing the station point too near the object; although such representations are equally as true, by the rules of perspective, as those which approach nearer in resemblance to the original. In pictures for general observation, such a position should be chosen as an indifferent spectator would take without straining his eye, and which must always be regulated according to the size of the object.

ILLUSTRATION.

Let A B C D, Fig. 1, Plate D, represent a plane; either paper or canvas, upon which a subject is to be drawn; and a spectator to be so placed, as to view the same to the best advantage: the question is, what position and distance he should take to view it advantageously under such circumstances. It is evident in this case that the picture A B C D, will be seen most to advantage when the axis of the eye X

Fig.1.

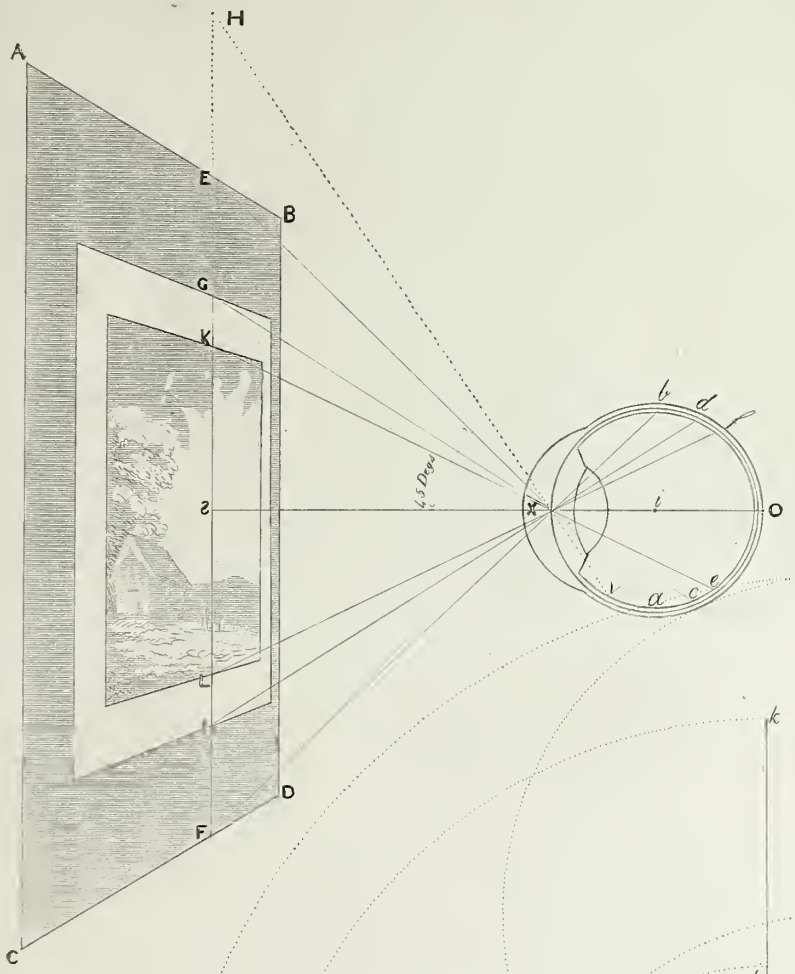
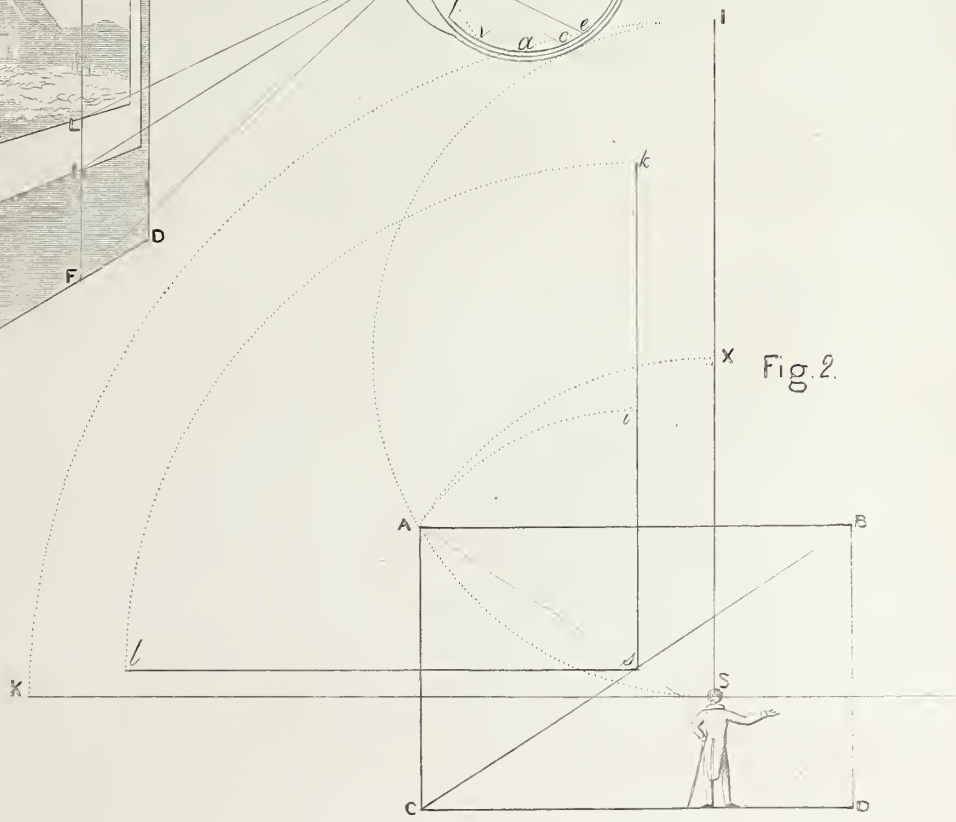


Fig.2.



is perpendicular, or at right angles to it; because the picture in this instance will be parallel to the retina or back part of the eye *b o a*.

And again if the said axis X cuts the middle of the picture at S, all the extreme parts of the plane A B C D, equidistant from the central point will be equally inclined to the eye; that is, the rays E X and F X, proceeding from the points E and F, will enter the pupil of the eye at X under the same angle; and the appearance of these rays will be the nearest in this instance to the centre of the retina at O; and thus the whole picture will be seen to the most advantage, when the seat of the eye is placed in its centre S: see the diagram Fig. 2.

The seat of the eye being determined; its distance from the picture or object under view is next to be considered. If we place ourselves too near the object, the whole of it cannot be seen, and if too far removed from it, the more minute parts cannot be distinguished. Let S, be the seat of the eye in the picture, A B C D; if the eye be removed from it equal the distance S E, as at X; a ray drawn from E, through the centre or pupil at X, will cut the axis or line S *o*, at an angle of 45 degrees, which would be the greatest angle under which the object would be visible. For let the point be raised to H, the line H X, passing through the pupil of the eye would not be conveyed by the crystaline humour (tinctured blue in the Diagram,) on to the retina, it being below it, as at V; as may be seen in the figure.

The point E, fig. 1, although visible, cannot be seen distinctly; being too far removed from the centre of the retina at *o*. The points G and I, whose distance is G S or S I from the seat of the eye at S, is not two-thirds of the distance S X, and will therefore be a much better boundary for its limits, as seen at *d* and *c* in the eye; because the rays G X and I X, cut the axis S X, at a less angle, and consequently bring the points *d* and *c*, nearer to the centre of the retina at *o*. Again admit the extreme distance of the picture from the eye not to exceed the distance K S or S L; (half the distance S X,) the appearance then of such picture will occupy the space or diameter *e f*, which space would approach nearer to a plane surface, than the curves *a o b*, and *c o d*: in this case, the figure on the picture and its image on the retina will be nearly similar.

The shortest distance that can be allowed, is that, which the farthest point of the picture is from its centre. Let A B C D, fig. 2, represent a picture and S its centre; the distance S A, set on to X, is the shortest to be taken. Instead therefore of making this the distance of the picture, it will be more advisable to make it twice this distance, namely the distance of S I; as such would be a distance any person would naturally choose in order, to see the whole without losing sight of the minuter parts; and which is here laid down on the horizontal line from S to K. If the seat of the eye be directly in the middle of the picture A B C D, as at *s*, the distance *s i*, equal *s* A, will be shorter than the distance S X; and which would in consequence make the distance *s k*, shorter than the distance S I; it will therefore be more advisable to place the eye at S, rather than at *s*. It must here be remarked that he who works with a short distance, will produce a picture greatly distorted; but if he use a long distance, or one not less than twice the distance, the farthest extremity of the picture is from the seat of the eye, no deformity will arise: therefore a long distance is the most advisable to be used.

EXAMPLES.

Plate I.

To delineate or find the representation of a square on the ground plane, the length of one side a b, being known, and placed parallel to the picture.

Let G G, Fig. 1, represent the line of the directing plane, (the plane supposed to pass through the spectator's eye, perpendicular to the horizon as before described; and commonly called the Ground line.) Let H H, represent the horizontal line; (its height from the ground line in this diagram being assumed;) S, the centre or point of sight; and D D, the points of distance, taken at pleasure and set equally right and left from S. Thus far being arranged, suppose *a b*, to measure the side of a cubical or square figure: set the length of this on the base line, and from its extremities, *a* and *b*, draw lines or visuals tending to S; a line from *a* or *b*, drawn to the point of distance D, will intersect the visuals, *a* S, and *b* S, in the points *d* and *c*;

PERSPECTIVE I.

Fig 1.

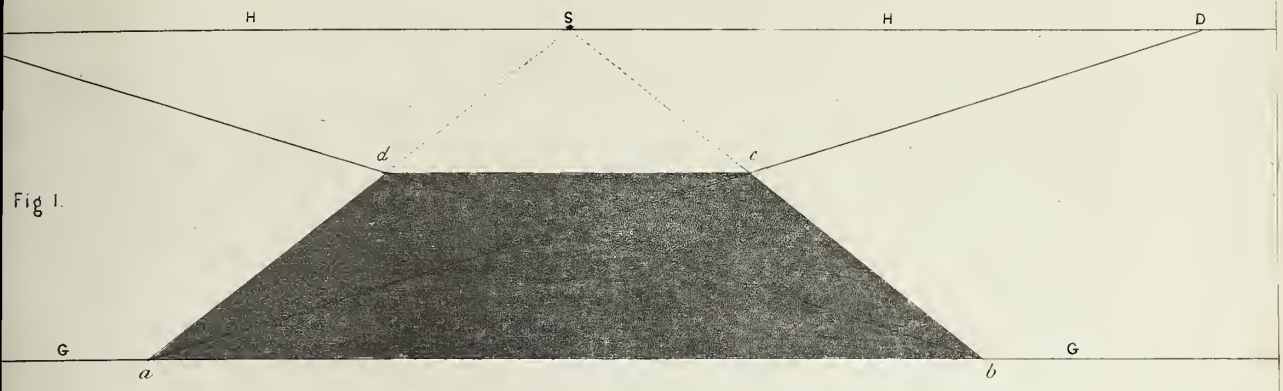
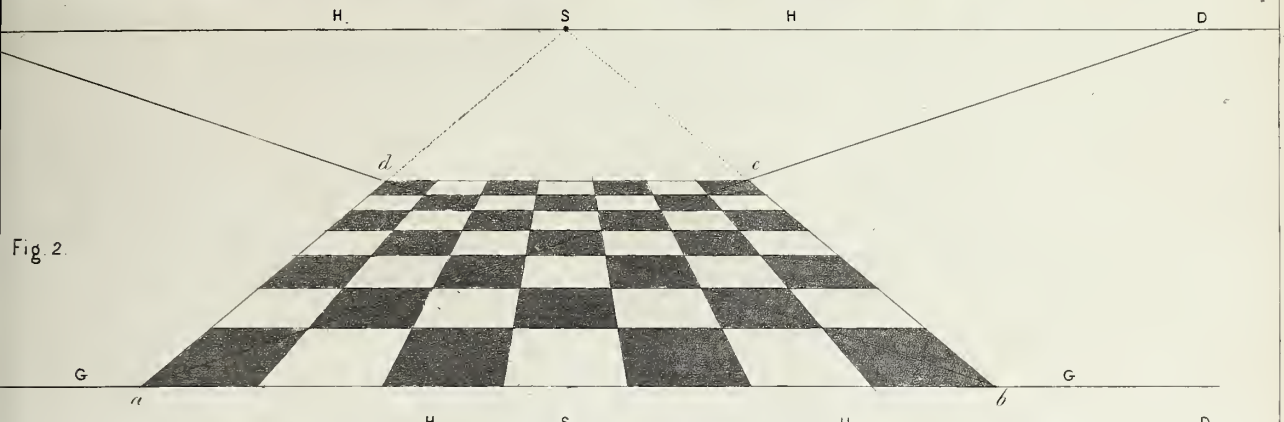
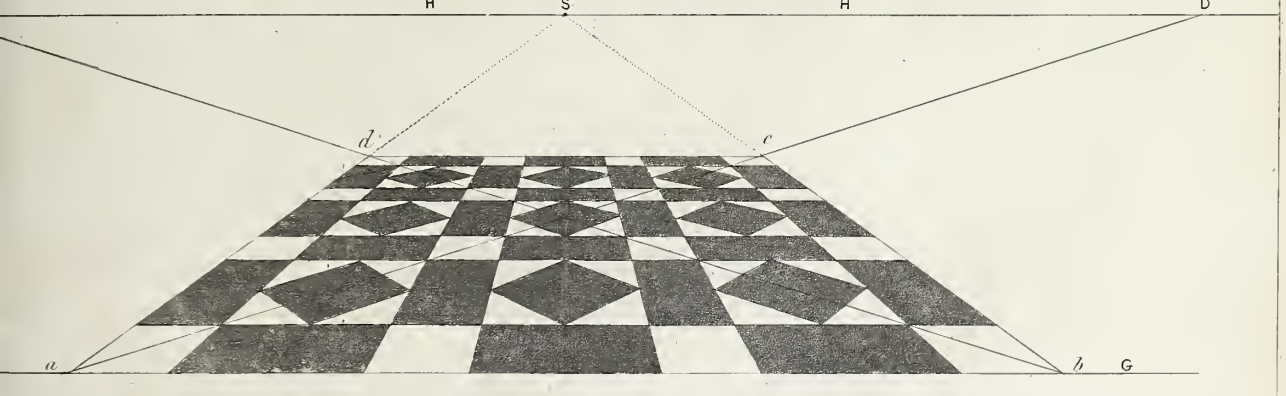
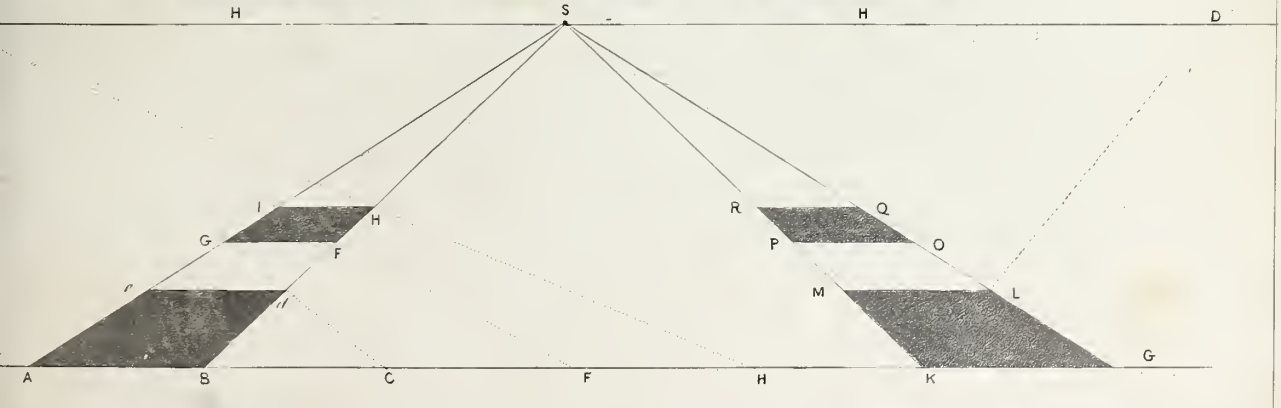


Fig 2.







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through these intersections draw a line *d c*, parallel to the base line. This will complete the perspective representation of the figure *a b c d*. The lines *b* D, or *a* D, are commonly called diagonal lines; because they pass through the opposite corners of the perspective square *a b c d*.

Figure 2.

To represent a pavement of squares in perspective, two of their sides being parallel to the picture.

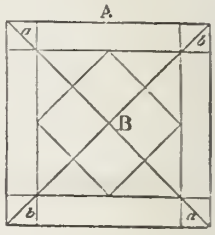
Let G G, represent the ground line as before; H H, the horizontal line; S the point of sight; and D, D, the points of distance. Take the measure of one side of a square, and repeat it any number of times on the ground line from *a*; in this diagram seven are shewn: from each of these divisions, draw visuals, tending to the point of sight, S; a diagonal line drawn from *a* or *b*, to the distance D, will intersect these visuals in seven different points; through these points draw lines parallel to the base line G G, and the pavement will be completed; as shewn by the black and white chequers.

Figure 3.

To represent a pavement of squares, having lozenges or rhombs, with a border between each square.

First proceed and set off the width of the border on the ground line, from *a*, (in this diagram left white:) next set off the side of a square, (here shadowed black;) and again repeat the border, and so on for as many squares and borders, as you may require. In the present example there are three squares, and four white spaces, making the borders; to obtain the perspective representation of these, and their distance from each other, as they recede from the eye; proceed as directed in fig. 2. For the lozenges

or rhombs, find the centre of each square on the ground line; and from these points draw lines tending to S, which will intersect the parallel sides of all the distant squares and give their centres: lines drawn from these to the points of distance D and D, right and left, will give the sides of the lozenges.



It will be seen by the annexed Fig. A, that the sides, making the lozenge B, are parallel to the diagonal lines *a a* and *b b*, of the square A; which Diagonals would tend to the point of distance; for which reason the sides of the lozenge would likewise tend to the same points: for all lines parallel the one to the other and amongst themselves would vanish into one and the same point.

FIGURE 4.

To find the representation of squares placed at different distances from each other, their sides being parallel to the picture.

The horizontal line H H, and ground line G G, &c. being assumed as before, let K G, be one side of the square to be represented, the depth of which, K M, may be obtained by the same process as that used in fig. 1. Suppose another square, as O P Q R, be required, situate at a distance equal to the width of one side of the square, G K L M: proceed and draw a diagonal line from M, to the distance D, cutting the visual line G S, in O; a line P O, drawn through this intersection, parallel to M L, will represent its front or nearest line; its depth P R, may be obtained as before directed. Another method may be adopted for obtaining the side of a square, or the depth of any parallelogram. Set the measure of the front side A B, upon the ground line G G: if the figure is to represent a square, then the measure of one side must be set from the nearest corner B, to C, upon the ground line; a line drawn from this point to the distance D, will give its depth on the visual B S, at the point *d*; through which a parallel line *d e*, must be drawn. If the depth of the figure be equal to twice its length; the measure B C, must be repeated from C to F, and cut off on the visual B S, at F; the depth in this case will be represented by the length B F: If three times its length,

PERSPECTIVE. 2

Fig 1.

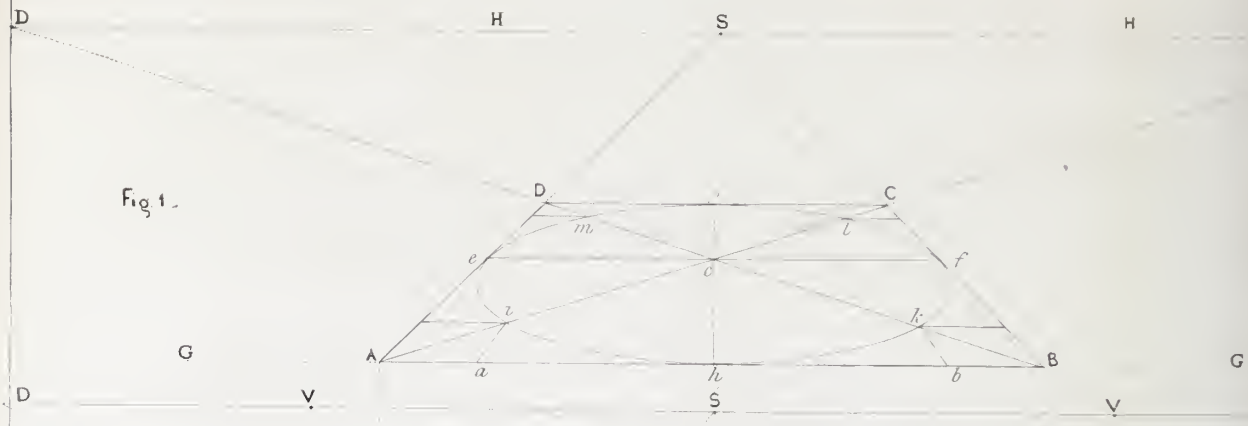


Fig 2

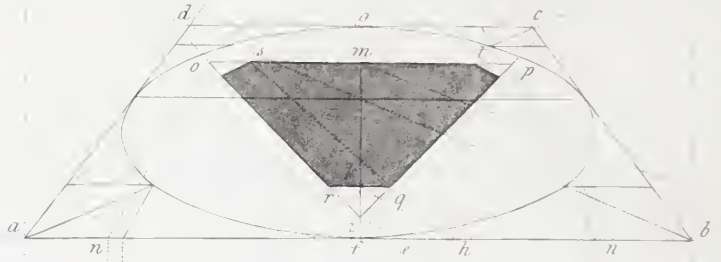
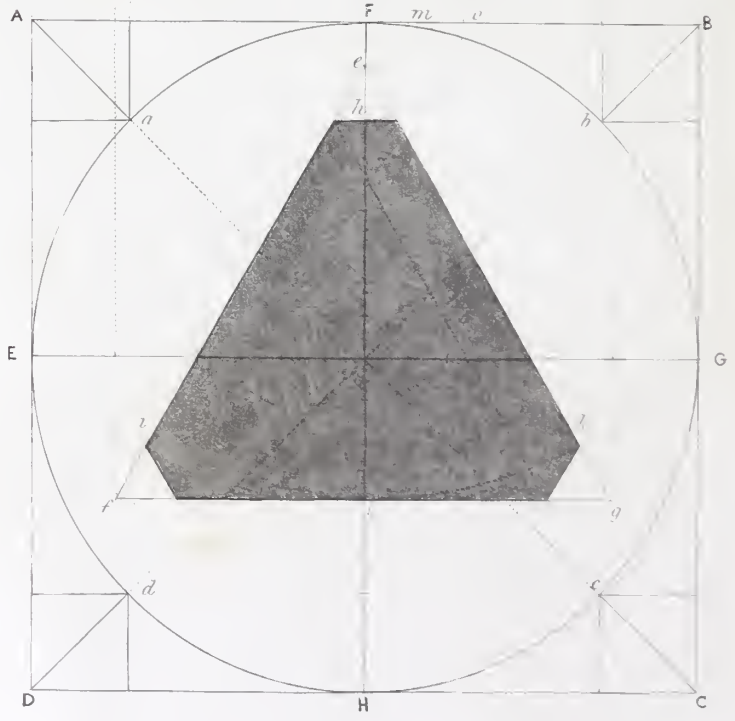


Fig 3



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the same measure may be repeated from F to H, on the ground line, and cut off on the visual B S, at the point H, as before directed. This method may likewise be adopted for representing the distance of one figure from another, as shewn by the tinted squares A B *d e*, and F G H I; likewise any given depth may be obtained by this process.

Plate 2.

Figure 1.

The Diameter of a circle being given or known, to find or draw the perspective representation of the same; being situate on the Ground plane, and placed parallel to the Picture.

Suppose E G, Fig, 3, to be the given Diameter; proceed and describe the circle E F G H; next circumscribe this circle by the square A B C D; from the corners of which draw the diagonals A C, and B D, intersecting the circle's circumference in the point *a b c d;* these with the four central points E F G H, (produced by the two diameter lines E G and F H,) will make eight divisions on the circle's circumference, and become so many points through which it would pass.

It is necessary in order to obtain the perspective representation of the circle, to find the perspective situation of these points on the ground plane; for through such points the outline of the circle (forming an elipsis) must be traced.

The Ground and Horizontal lines; the points of sight, and distance being determined; transfer the circle's diameter E G, Fig. 3, on to the ground line G G, Fig. 1; as denoted by the letters A and B; and find the perspective representation of the square A B C D, (bounding the circle's circumference) by the diagram, Fig. 1, Plate 1. Through the axis *c*, draw the lines *e f*, and *g h*; intersecting the sides of the square at the points *e, f, g*, and *h*: these will become the four tangent points. The four other points on the diagonals A C and B D, may be obtained by transferring the points *a* and *b*, Fig. 3, upon the line A B, Fig. 1; as denoted by the letters *a* and *b*; from these points draw lines tending to S, which will intersect the diagonals

A C and B D, in *i*, *k*, *l* and *m*. Through these eight points on the ground plane, the outline of the circle must be traced.

This method of obtaining the representation of a circle by eight points will answer for any circular figure of a moderate size; but for circles of larger proportion, sixteen and sometimes twenty or more points are made use of.

Figure 2.

This Diagram shews the same Circle in perspective, with the addition of a Triangle in the centre; which may represent the plan of a block for a Loo Table; the Circle representing the top.

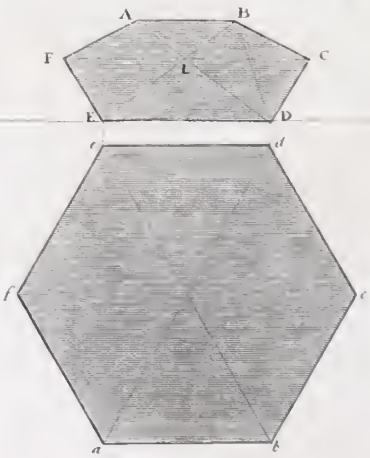
In making the plan, first find the proportion the equilateral triangle *e f g*, (Fig. 3), should bear to the circle, by Fig. 1, Plate 4, Geometrical Figures; and the mode of constructing it by prob. 8, Practical Geometry.

This being done, proceed and draw the circle in perspective, by the method adopted in the preceding diagram. For the triangle, transfer the distances F *e* and F *l*, in the plan, upon the line A B, at *m* and *n*, as shewn by the dotted curved lines; and square these measures perpendicularly on to the line *a b*, Fig. 2, at *e* and *l*. From these points draw lines tending to the point of distance D, until they intersect the central ray *f g*, at *i* and *m*. Through the point *m*, draw a line parallel to A B, at pleasure. Next transfer the points *f* and *g*, (Fig. 3,) perpendicularly on the line *a b*, (Fig. 2,) at *n* and *n*; from which points draw visuals tending to the point of sight S, until they intersect the line drawn through *m*, at *o* and *p*; which will give the length of the parallel side: join *i o* and *i p*; this will give the two other sides, and complete the triangle. The vanishing points of these two sides are found by continuing *i o* and *i p*, to the horizontal line intersecting it at V and V. The canted corners are found by transferring the distance F *h* in the plan, (Fig. 3,) on to the line A B, from F to *o*; which must be squared up perpendicular to *a b*, (Fig. 2;) as at *h*. From this point draw a line tending to D, until it intersects the visual *f g* at *k*; a line drawn through this point and terminated by the sides, *i o* and *i p*, will give the representation of the canted corner *h*, in the plan; for the corners *i* and *k*, draw

PERSPECTIVE. PLATE 3

FIG 2

FIG. 1



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lines from *q* and *r*, tending to V and V, until they intersect the side *o p*, in *s* and *t*; lines thrown back from these, by the Vanishing points V and V, will give the other two canted corners, and complete the perspective representation of the triangular block, as shown by the tinted figure.

Plate 3.

To find the Perspective representation of a regular Hexagon or six-sided figure; one side being parallel to the picture

It is necessary to observe that the inclined sides of a regular hexagon are parallel to those of an equilateral triangle; for as there are six equilateral triangles comprised in every hexagon, whose sides are equal; each angle contained therein will measure sixty degrees; it follows therefore that each of the inclined sides of such triangle would be coincident to the inclined sides of an hexagon. Knowing thus much, the Vanishing points in the horizon for the inclined sides of this figure, are easily laid down.

OPERATION.

The Horizontal Line, the Station Point, and Distance of the Picture being determined, the following process for finding the Vanishing points may be adopted. From the Station point S, (Fig. 1,) on the Horizontal line H H, raise a perpendicular S I, which make equal to the distance of the picture. Through I draw the line G K at pleasure; and on I as a centre, with any radius at discretion, describe the semicircle X X X, which divide into 3 equal arcs as numbered: each arc will then measure an angle of 60 degrees, and consequently measure the side of an equilateral triangle. Through the divisions 1 and 2, draw lines from I, until they intersect the Horizontal line in the points V, V. These points are the Vanishing points for the inclined sides of the Hexagon.

Having constructed the plan of the Hexagon *a b c d e f*, by problem 22, Practical Geometry, commence by drawing the ground line G G, upon which transfer the parallel side *e d*, as at E D; from E and D, draw

visuals tending to S; draw also the lines E B and D A, tending to V, V, and intersecting each other at L. Through L, draw a line parallel to E D at pleasure. Next from E and D, draw lines tending to V, V, until they intersect the parallel line through L at F and C; F E D C will then represent one-half of the figure. The other half is obtained by drawing lines from F and C, to the respective vanishing points, until they intersect the visuals E S and D S, at A and B. Draw the line A B, which will complete the perspective representation of the original figure, as shown by the tint.

Fig. 2, is a Diagram which shows how the preceding example may be applied in various ways. It represents the interior of an apartment, the floor of which is shown as covered with a carpet, having the pattern made out wholly of Hexagons; at the end is represented an Hexagonal bow, making half the plan of the Hexagon, fig. 1. From the centre of the ceiling is suspended a lantern of the same figure; the Vanishing points V, V, of this Diagram are laid down from the centre S, at double the distance of those in fig. 1; the points of distance after the same ratio. The spaces *e d*, *e d*, *e d*, refer to the original measure of the side *e d*, fig. 1, being taken at one-fourth the size. The mode of representing this floor of Hexagons will be shown more at large in the following Diagram.

To represent a floor of Hexagons in parallel perspective.

Suppose G G, (Fig. 1, Plate 4,) to be the ground line; H H, the Horizontal line (the height of which, in this example, is taken at pleasure); C the centre of the picture (or point of sight); and D, its distance. Proceed and lay down the Vanishing points for the inclined sides, as directed in the preceding example. Divide the Diameter, *d f*, of the Hexagon into two equal parts, one of which will be the measure of one side. Take this measure in the compasses, and repeat it along the line G G, right and left of the centre *e*, as often as the width or length of the floor will allow. From these divisions so placed, draw visuals tending to the point of sight C, as *a* C, *b* C, *c* C, &c. Next, from *a*, *b c*, &c. draw lines tending to each Vanishing point: the intersection of these lines with each other as at *k*, *k*, *k*, &c. will give the centre or axis of each Hexagon, throughout the whole surface of the floor.

PERSPECTIVE PLATE 7

FIG 1

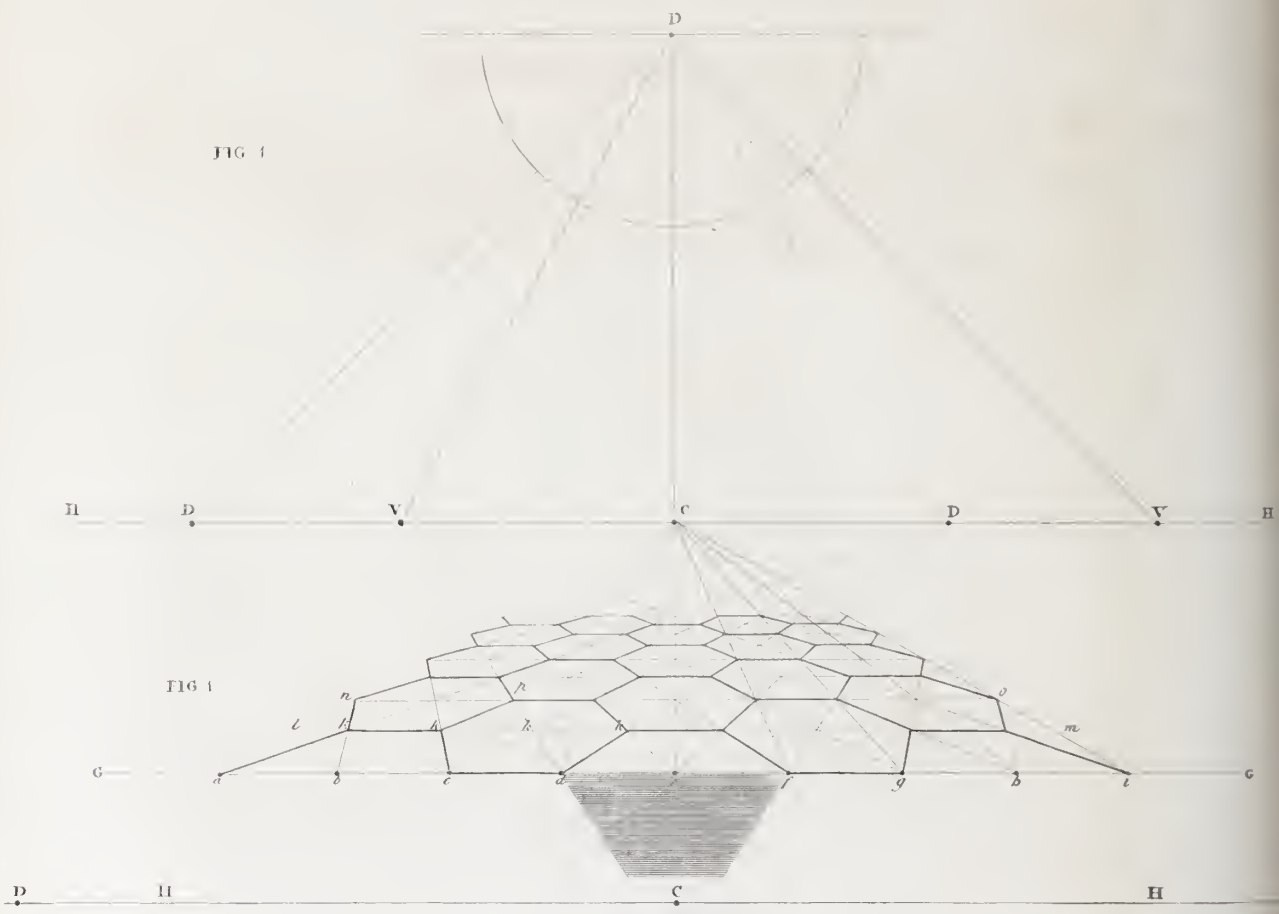


FIG 4

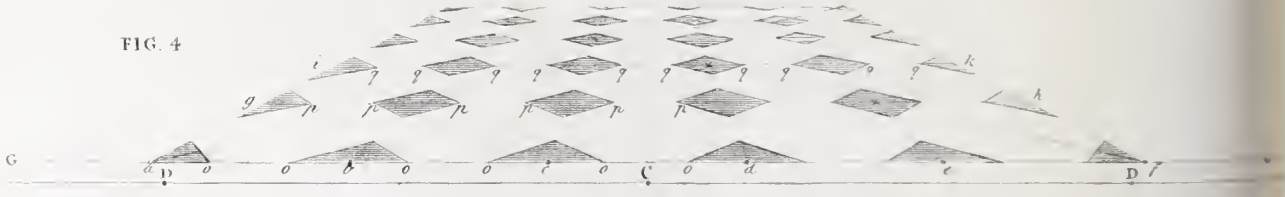
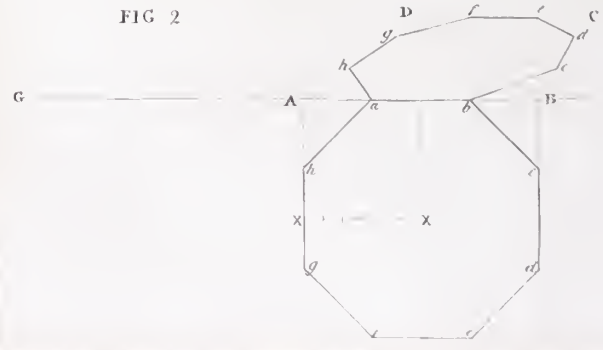


FIG 2



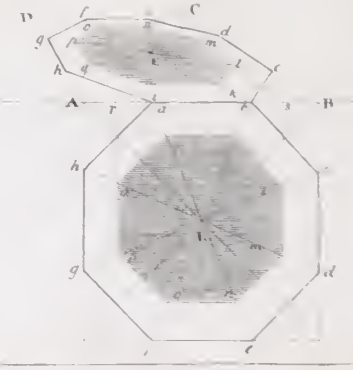


FIG. 3

Through these intersections, draw the lines *l m*, *n o*, &c. parallel to the Ground line: these will receive and limit the inclined sides of each Hexagon, as at *a k*, *c k*, *k n*, *k p*, &c. by this means the whole will be completed. The figure of each Hexagon must afterwards be denoted by stronger lines.

To represent an octagon, Fig. 2, in Perspective, two of its opposite sides being parallel to the picture.

As every octagon has four of its sides coincident to those of a square, and the remaining four parallel to the diagonals of such square; it follows, that if two of its sides are parallel to the picture, two would be at right angles with it, and the four other sides inclined to it at an angle of 45 degrees: consequently the Vanishing points of an octagon would be the centre and distance of the picture. The distance of the picture being determined, this must be set on the Horizontal line, right and left of the centre C, as at D D. These then become the Vanishing points for the inclined sides.

Having proceeded thus far and constructed the figure of the octagon *a b c d*, *f g h*, by problem 24, Practical Geometry, transfer the diameter of the square containing it, on to the Ground line G G, as at A B; and find the perspective representation of this square as directed in the diagram, fig. 1, plate 1. From *a* and *b*, draw visuals tending to the centre C, and cutting the line D C, in *f* and *e*: this will represent the side opposite to *a b*, in the plan. A line drawn from the point *a* to the point of distance D, will, where it intersects the Visual A C, give the representation of the inclined side *a h*, in the plan. A line drawn from *b* to the opposite point of distance D, where it cuts the Visual B C, will give the other inclined side *b c*. A line thrown back from the point *f*, by the point of distance D, will give the representation of the opposite side to *b c*; also a line thrown back from *e*, by the opposite point of distance, will give the representation of the opposite side to *a h*; and thus the perspective figure of the octagon will be completed. If an octagon be required to be represented in Perspective, where no plan is given, the method used to obtain the measure of one side as directed in problem 25, Practical Geometry, must be adopted; as shewn in the plan by the divided line *x x*.

Fig. 3, shews the method of representing one octagon within another by means of Mitre lines.

Having obtained the Perspective representation of the larger octagon as above directed, find the axis by drawing the Diagonal lines A C and B D, which will intersect each other at *e*; to this point the mitre lines from each corner of the octagon must be drawn. To obtain the smaller octagon, square up its diameter from the plan upon the line G G, as at *r s*. From these points draw visuals to C, which will intersect the mitres from *d*, *c*, *g*, and *h*; at *l*, *m*, *p*, and *q*; this will give the representation of the two sides, *l m* and *q p*, in the plan. The other sides are obtained by throwing lines from the points *l*, *m*, *p*, and *q*, by the points of distance terminating them on the different mitre lines, as will be seen by inspection of the figure.

To represent a square of octagons, Fig. 4, in parallel Perspective.

Having drawn the Horizontal line H H, and laid down the points of distance as before directed, take the measure of the diameter of an Octagon in the compasses, as *a b*; and repeat it along the Ground line G G, as often as occasion may require. From these divisions *a*, *b*, *c*, *d*, *e*, *f*, so placed, draw visuals tending to the centre C. A line drawn from *a* or *f*, to the point of distance D, will intersect these visuals in the points *x x x*, &c; through these points draw lines parallel to the Ground line G G, and the whole square will be perspectively divided into smaller squares. Next find the centre of each square on the Ground line, from which set one-half the measure of the side of an octagon to be represented, as *o o*, *o o*, &c. which draw to the point of sight C. These will intersect the parallel lines *g h*, *i k*, &c. at the points *p p*, *p p*, *q q*, *q q*, &c. which will give the measure of the sides, *o o*, *o o*, &c. on all the distant squares. Lines drawn from these points to the points of distance, where they intersect the visuals *a* C, *b* C, and *c* C, &c. will give the representation of the inclined sides of each octagon throughout the whole surface of the square.

PERSPECTIVE.

PLATE 5.

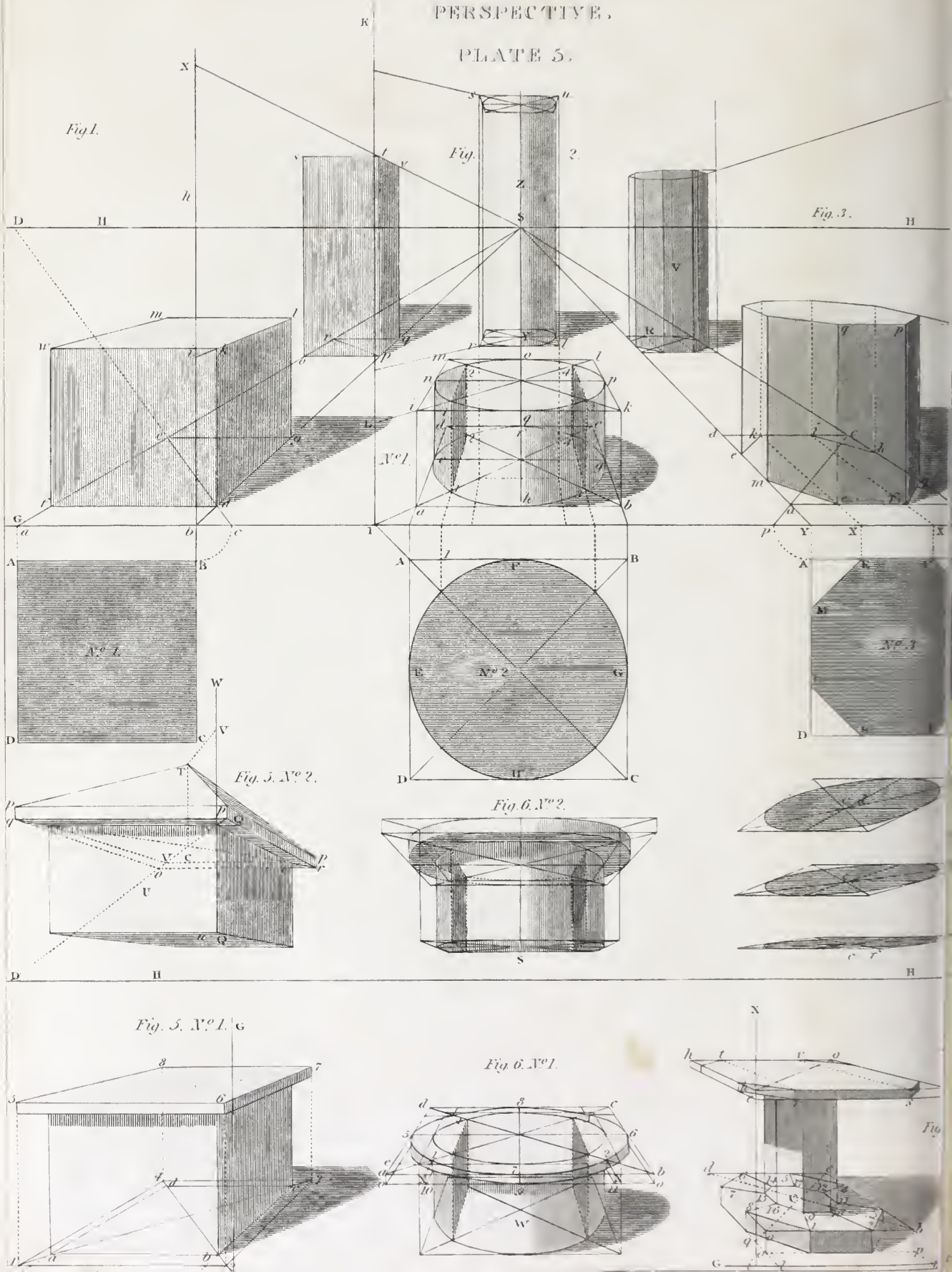


Plate 5.

The plan and Elevation of a Cube being given, to represent the same in parallel Perspective.

A B C D, No. 1, Fig. 1, is the given plan of the cube: G G, the line of the directing plane or Ground line, H H, the Horizontal line; S the centre or point of sight; and D, D, the points of distance. Square up the side A B of the cube, on to the Ground line at *a* and *b:* from these points draw visuals (*a* S and *b* S) tending to the centre S: likewise transfer the space B *b*, (the distance between the side A B, and the directing line) from *b* to *c*. A line drawn from *c* to the point of distance D, will intersect the visuals *a* S and *b* S, at *d* and *e*; through these points draw the lines *e g*, and *f d*, which will give the perspective plan of the cube; and likewise its distance from the directing plane. From the corners *f*, *d*, and *g*, raise perpendiculars at pleasure; also from *b*, raise the perpendicular *b h:* this line being in the Directing Plane, is denominated an Original or Geometrical line, and on which line all original heights must be placed. On this line from *b*, set up the height *b i*, of the Cube (equal to its width,) and draw the Visual *i* S; its intersection with the perpendiculars *d* and *g*, will give the Perspective height of the Cube, at *k* and *l*. From *k* draw the parallel *k w*, intersecting the perpendicular raised from *f*, at *w*. From *w*, draw the Visual *w n*; and from *l* draw the parallel *l m*, terminated by the former at *m:* this will complete the representation of the Cube.

The Parallellopiped or Prism *o p q v t s*, being under the same Visuals with the Cube *f d g l m w*, but of greater height, its seat is obtained by setting off its Distance from the directing Plane, upon the Ground line from *b* to W: a line drawn from this Point will give the seat of the Prism at *o p*, and its depth by the intersection at *r*. Parallels drawn from *p* and *r*, and terminated by the Visuals, will complete the plan. From *o*, *p*, and *q*, erect Perpendiculars at pleasure. On the Original line *b h*, place the intended height of the Prism as at X; from which, draw the Visual X S: its inter-

section with the Perpendiculars at *t* and *v*, will determine the height of the figure, which is completed by drawing a parallel from *t*, to the perpendicular line *o s*.

To find the Perspective representation of a Cylindrical Solid.

Let A B C D, No. 2, Fig 2, be a square inscribing the circle E F G H, as making the plan of the Cylinder.

Transfer the Diameter A B of the square to the ground line, as directed in the preceding figure; and obtain the Perspective plan of the square and Cylinder, by the Diagram, Plate 2. Erect Perpendiculars from the points *a* and *b*, in the perspective square *a b c d*; and draw the Original or Directing line I K; on which set up the height of the solid as at L. A line drawn from L to the Point of Distance D, will intersect the Perpendicular raised from *a*, at *i*: this will determine the height of the upper square, in which to draw the Perspective Circle, *n o p q*, equal to that on the Ground Plane. From *i* draw the parallel *i k*. From *i*, and *k*, draw the Visuals *i m* and *k l*, intersecting the Diagonal lines, *i l*, and *k m*, at *l*, and *m*; through which, draw the parallel *m l*, which will complete the upper square. The Diagonal Points may be obtained by squaring up the same points from the lower square, on to the diagonals, in the upper one; as shown by the dotted lines, 1, 1; 2, 2; 3, 3; and 4, 4. From the extremities *n* and *p*, of the Ellipsis, drop the perpendiculars *n e*, and *p g*; this will complete the Perspective representation of the Cylindrical Solid. Such figure is called the Frustrum of a Cylinder and sometimes a truncated column. The perspective representation of the column Z, is obtained thus:—Find the seat of the square Y, on the ground plane, and the perspective circle contained in it, as before directed. From each corner of the square so obtained, raise perpendiculars: on the original line I K, set up its height from the ground, which draw to the distance D, and where it intersects the perpendicular *r* at *s*; this will determine the height of the column. Through *s*, draw a parallel, *s v*, terminated at *v* by the perpendicular from *t*; and complete the square with the perspective circle contained in it as before described; this being done, join the extremities of the two Ellipses, as in the cylindrical solid placed below it, which may be seen by inspection of the figure.

This diagram is given, to show the perspective appearance of the circle when placed beneath or above the horizon. In chairs and tables, whose legs are below the horizon, the mouldings will have for their outline the curve of the ellipsis Y, as seen in front. For bed pillars, cheval glass frames, standards, &c., where the upper mouldings are above the horizon; these will take for their outline the curve of the elipsis at W. Remark that the perspective representation of the circle, as it approaches nearer to the Horizontal line, whether above or below it, will become more and more flattened, until it falls into the horizon itself; in which case it will become a straight line; as may be seen in figure 4, wherein C *d*, the uppermost plane, is seen more fully than the plane C *e*; and again C *e*, more plainly than C *f*, which is so much nearer the horizontal line H.

To find the Perspective representation of an Octangular solid.

Let A B C D, No. 3, Fig. 3, be a Geometrical Square, inscribing the octagon E F G H I K L M. Transfer the side A B of the square on to the ground line G, G, as at Y Y; also the side E F of the octagon, as at X X: from these draw Visuals tending to S, as Y S, X S, &c. Next transfer the distance (A Y) of the Octagon from the plane of the picture, from Y to *p*; this drawn to the distance D will intersect the Visual Y S, at *a*: draw the parallel *a b*, and complete the square *a b c d*, as before directed: next find the perspective plan of the Octagon, by the Diagram, fig. 2, plate 4: from each angle of the Octagon so obtained, raise perpendiculars; also the Geometrical line Y P, from Y, and the perpendicular line *b n*. Upon the line Y P, set up the height of the figure as at N. This draw to the centre S: its intersection with the line *b n* at *o*, will give the perspective height of the figure. A parallel drawn from *o* and intersected by the perpendiculars *e* and *f*, at *q* and *p*, will give the parallel face of the upper Octagon. The remaining faces are obtained by drawing their sides to the respective Vanishing points, D D, terminated by the perpendiculars as before explained.

The Octagonal Prism V, being under the same Visuals, namely Y S, &c. is obtained by the same process. Its seat on the ground plane is

governed by that of the cylinder (before explained). Its height is determined by placing it on the original line Y P, as at *r*, in the same manner as that of the preceding example. Remark, that this figure is likewise given to show the difference in the outline of the Octagon, either above or below the horizon. If you wish to represent the interior of a bow window, peculiar to many of our old English mansions; all the lines that are below the Horizon will answer to the concave part of the ground plan at R, and all those above the horizon will answer to the concave part of the upper Octagonal plane at T. In what relates to the circle, the same applies to the octagon; for being circumscribed by a square, it is subject to the same diminution the nearer it approaches the Horizon; and will, as the painters express it, become more and more foreshortened, until, like the circle, it would fall into a straight line.

No. 1, Fig. 5, represents a cubical object having a top, (5,6.7,8,) projecting equally over the four sides.

Let A B be the measure of one side of the cube to be represented; and B C its distance from the directing plane. Proceed and complete the Perspective plan *a b c d*, as in fig. 1, from which raise perpendiculars, as before. From A and B, set off the projection of the top as A D and B D, which draw to the point of sight S, intersecting the Diagonals *a c* and *b d*, at the points 1, 2, 3, 4. On C erect a perpendicular C G; this will become the Geometrical line: on this line set up the height of the cube, also the thickness E F, of the projecting top, which draw to the point of distance D; and where they intersect the perpendicular raised from 2, you will obtain the projection of the top at the point 6; (the nearest to the spectator.) From 6 draw Visuals tending to the point of sight S, and where they intersect the perpendicular raised from 3, you have the projection on the returning side, as at 7. From 6 and 7 draw parallels, and where they intersect the perpendiculars raised on 1 and 2, as at 5 and 8, you will have the farthest projection: draw the Visual 5, 8, tending to the point of sight S, and the figure will then be completed.

This Diagram is applicable to all objects of furniture that are under the Horizon; whether tables, commodes, &c. that have an equal projection of top, or mouldings round their sides.

The upper figure represents the same cube, having the same projection over the top, but seen above the Horizon; the Geometrical line being differently placed; namely on the nearest angle of the cube. To obtain the projection in this Example, draw the Diagonals Y V and X Z, which Diagonals prolong at pleasure: on the Diagonal at Y, place the projection *o*, which will be that nearest to the spectator; and draw the Visual *o r*, tending to the point of sight S, which will intersect the Diagonal X Z at *r*, and give the furthest projection *p r*. From *o* draw the parallel *o q*, which by its intersection with the Diagonal X Z at q, will give the opposite projection to *o*. Next let the perpendicular line from Q be continued at pleasure towards W; on which line set up the intended height of the pyramidal roof, from Y to V; which draw to the point of distance D, and where it intersects a perpendicular raised from the centre or axis C, of the square X Y Z V, will determine the perspective height at T. Lastly draw the lines T *p*, T *p*, and T *p*, which will complete the figure.

The cornices of rooms, and the projecting members of all objects seen above the Horizon may be obtained from this diagram. The square figure U, may be supposed to represent the body of a book-case, wardrobe or any other object; and *q o r*, the projecting cornice.

Fig. 6, No. 1 and 2. These cylindrical figures are the same, and obtained by the same means as that of No. 1, fig. 2; with the addition of a projecting member to each, as seen above and below the horizon. Having constructed the cylinder W, by the process used in No. 1, fig. 2, prolong the diagonals, corresponding to those marked *m k* and *i l*, in the same figure; also prolong the line *i k*, upon which, from *i* and *k* set off the given projection, as at *e*: this convey on the diagonals by the point of sight S, at the intersections *a b* and *c d*, forming the larger square, as is shewn by the figure. Next, take little more than 1-7th of the line *a b*; that is, run the compasses along the line until the 1-7th division extends a little beyond the end of it at the point *b*; this being the proportion that the space A I, No. 2, fig. 2, bears to the whole line A B. Set this measure from *a* and *b* to *x* and *x*; which convey by the point of sight S, on to the diagonals *a c* and *b d*, as numbered 1, 2, 3, and 4. Next draw the diameters, 5 6, and 7 8: through these eight points the circle forming the projection may be traced. The under curve is obtained first, by dropping perpen

diculars from *a* and *b*, equal to the given thickness; through which draw the parallel line *o o*, which line will receive the diagonal points *x*, *x*, at 10 and 11; also the central point 7, at 9: these draw to the point of sight S, and where they intersect perpendiculars dropt from 1, 2, 5, and 6, will give so many points through which to trace the under curve. The projection over the cylinder No. 2, is obtained by the same process, as may be seen by inspection of the figure. The tinted Planes in these figures, as also those in No. 1, fig. 2, show the squaring of the seventh points upon the diagonals of such squares as are of equal dimensions, placed one above another.

Fig. 7 is an octagonal prism, standing on an octagonal base, and supporting an octagonal top.

First set off the width of the square, representing the top, upon the ground line G G, from *i* to *k*; also the width of the square making the block, from *l* to *m*. From *l* and *m* draw Visuals to the point of sight S, and from *i* draw a line to the point of distance D: its intersection with the Visual drawn from *l*, will give the seat of the front line of the block at *o*; from which draw a parallel line, intersecting the visual from *m*, at *p*; this will give the Perspective width of the square of the block. From *o* and *p*, raise perpendiculars; next set up the thickness of the block on the Geometrical line *i* X from *i* to *q*; this likewise draw to the point of distance D; and where it intersects the perpendicular raised from *o*, at *a*, will determine the thickness of the block. Next draw the square *a b c d*, as in fig. 1; and the octagon contained in it, as in fig. 3, which will compleat the block. For the Prism, draw mitre lines from each angle, (1, 2, 3, 4, 5, 6, 7, 8,) of the octagon, to the centre or axis C. Next set the given diameter on the line *a b*, at 1 and 2 (in this example equal to one side of the octagonal block:) this draw to the centre S, until it intersects the mitres 7, 8, 3 and 4, at 11, 12, 15, and 16, which will give the two sides parallel to those marked 7 8, and 3 4, on the block: the remaining sides are got by throwing lines back by the points of distance D, D, from 11, 12, 15, and 16, intersecting the corresponding mitres at 9, 10, 13, and 14; from which intersections, the two sides parallel to 1-2, and 5-6, may be drawn, completing the perspective plan of the prism. From each exterior angle visible to the eye, raise perpendiculars, as in the prism V, fig. 3. Next set up the height and thickness

of the top upon the Geometrical line *i* X, as at *e;* from which draw parallels at pleasure. Likewise square up the given width from *k* (on the Ground line), intersecting the parallel drawn from *e* at *f;* and complete the square *e f g h,* as before directed. Lastly, set off the given measure of the canted side, from *e* to *r* and from *f* to *s;* which convey on the line above by perpendiculars. Visuals drawn from these to the centre S, will give the measure of each cant on the back line *h g,* (of the square,) at *t* and *v.* Lines thrown back by the points of Distance from these intersections (*t* and *v,*) will give the four canted sides of the figure, as may be seen by inspection. By this example we are taught the manner of obtaining the Perspective representation of loo Tables with their pillars and bases, when of an Octagonal form; it is likewise applicable in gothic designs, whether for Tables, Candelabri, or any other object having octagonal supports. We shall now commence with the application of these examples, by delineating the various articles of Domestic Furniture in general use; giving the perspective lines with each example.

Plate 6.

To represent a Library or writing Table from a given plan and Profile.

No. 1, Fig. 1, is the scale to plan and profile, drawn $\frac{3}{4}$ of an inch to a foot.

No. 2, shews one half of the plan of the writing Table to be projected; *a b c d,* making the top; *f f o o,* the frame; and *e, e,* two of the legs.

No. 3, shews the profile of part of one of the ends with its mouldings, &c.

Having drawn the Ground line G G, take 4 feet from the scale, which measure set up from G G, for the Horizontal line. Next place the point of sight on this line at pleasure; observing to place it neither too near, nor too far removed from the angle or nearest corner B. The point of distance may be placed from the point of sight at pleasure, but not less than twice the length of the object to be represented; as before remarked in page 75: in this instance it is made longer, viz. 13 feet 4 inches; the length of the table

being 5 feet. Proceed and square up from the plan on to the Ground line the length *a b*, of the top, at E E; also the length *f f*, of the frame at F F; and the legs *e*, *e*, at M M: these draw to the point of Sight S. Next set off the width of the table from back to front, (equal 3 feet 6 inches,) from E to I; which draw to the point of distance, as shewn by the dotted line marked *Diag*, the point being off the plate: its intersection with the visuals drawn from E, F and M, will determine the perspective width of the top and frame of the table at K, and give the squares for the back legs at M; from which draw parallels, intersecting the corresponding visuals at the other end at K and M. For the front legs, draw a line from the nearest corner E to the point of distance; its intersection with the visual drawn from M, will give the square of the leg at the corner nearest to the spectator; which may be squared to the opposite visuals drawn from F and M: this will compleat the perspective plan. From E, raise a perpendicular E O at pleasure; on which line square all the original heights from the profile, as denoted by the dotted lines. The height of the table being squared on to the original line E O, as at B, must be drawn to the point of distance; its intersection with a perpendicular raised from the square of the frame at F, will determine the parallel front of the top at X, which must be continued to *y*, on the perpendicular raised from the opposite corner F: visuals must then be drawn from X and *y*, to S, intersecting perpendiculars raised from K and K (the furthest squares,) at C and D; draw the parallel D C, which will complete the top. Next from Z on E O draw a diagonal as before, tending to the point of distance, and where it intersects the perpendicular raised from F as before; this will be the perspective depth of the frame; which must be squared to the corresponding perpendicular from F at the furthest end, intersecting it an N; this will determine the length of the frame in front. From Z draw a visual to S, which by its intersection with the perpendicular raised from the square at K, will give the returning side at R. The top moulding being transferred to B; as shewn by the dotted line, its projection is determined by the original line E O; (it being in the Directing plane;) which must be continued to the perpendicular raised from E, intersecting it at A: a visual drawn from B and intersected by the perpendicular from K, will give the return. The small moulding at the bottom is found by carrying its thickness to Z, and from

PERSPECTIVE, PLATE. VI.

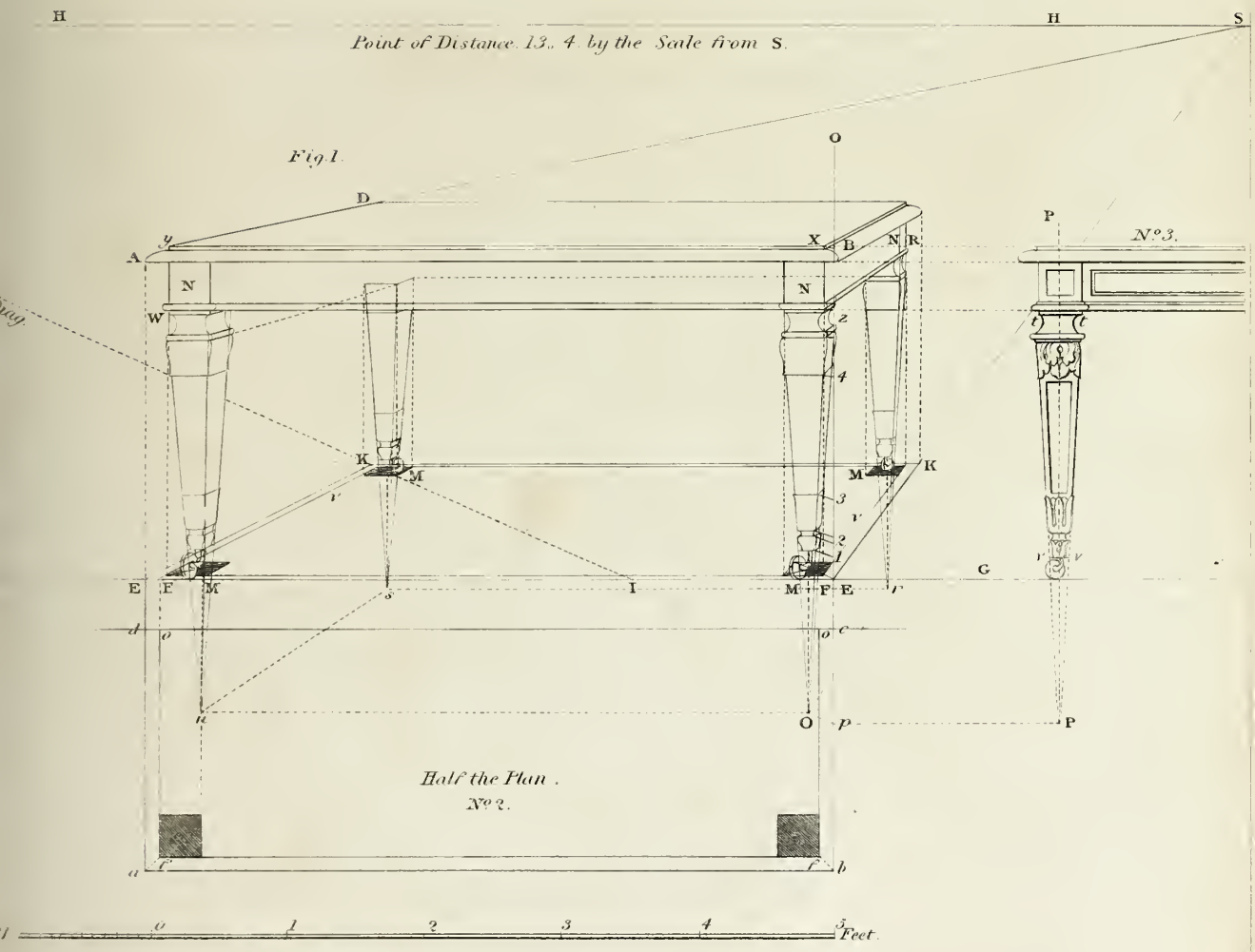
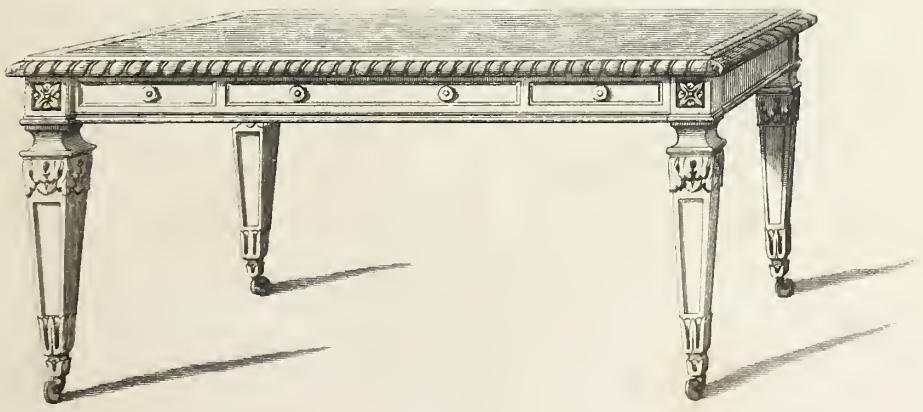


Fig. 4.



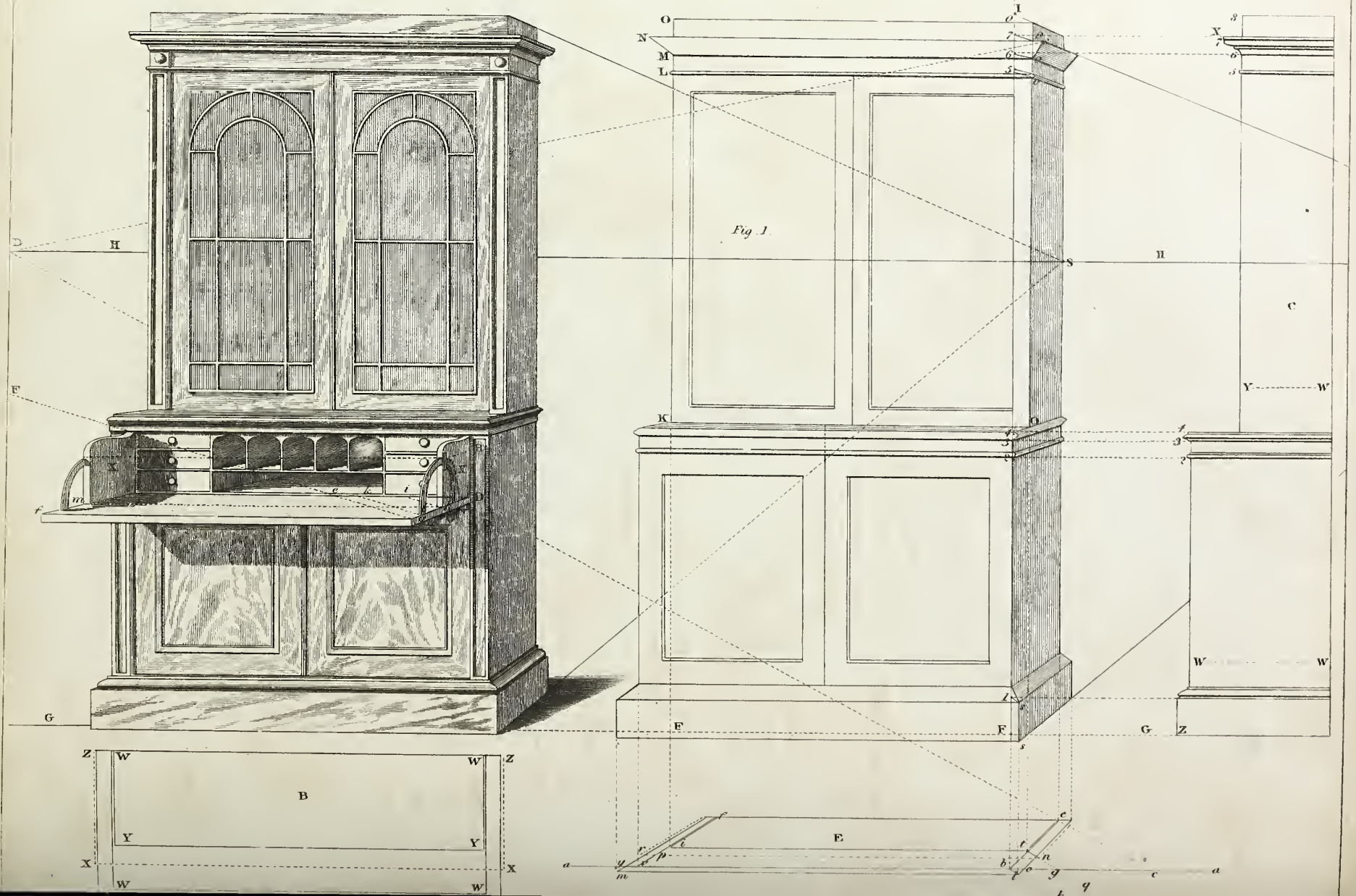
thence conveying it by a diagonal, to the corner line of the frame; this being on so small a scale, may in most instances be drawn by eye; the bottom line of the moulding being first obtained. Having thus completed the frame, draw the legs at N, N, N, which is done by squaring them up from the tinted squares in the perspective plan. The diminishing of the leg being determined in the profile, lines may be drawn from the under part of the frame, at *t t*, through the diminished part at bottom at *v v;* which two lines will unite and meet in a point on a line drawn through the centre or axis, at P. Next convey the point P, by a parallel, on to the original line *b* O, at the point *p*. Proceed and drop perpendiculars from the axes of the four squares, (M, M, M, M,) at pleasure. From *p*, draw a diagonal line, intersecting the axis of the nearest square (M E,) at the point O; this will be the perspective seat of the point P, in the profile. From O, draw a parallel, intersecting the axis of the farthest square F M, at *n*, which gives the opposite diminishing point to O. Visuals drawn from O and *n*, until they intersect the axis lines of the back squares, will give the diminishing points for the back legs, at *s* and *r*. These four points *n*, O, *r*, *s*, being obtained, proceed and raise perpendiculars from the perspective squares, F M, M E, &c. (in the plan), up to the bottom line of the frame, as at W, Z, R and D; which will give the squares of the legs at top: from these, draw lines to the apex points, *n*, O, *r* and *s*, and you have the diminishing lines for the legs. From the points, 1, 2, 3, 4, &c. as conveyed from the profile on to the original line, draw diagonals to the point of distance; their intersection with the diminishing line drawn from Z, will give the heights of the respective mouldings and ornamental parts of the leg Z; which may be squared on to the leg W. Those required on the leg R, may be obtained by Visuals drawn from the corresponding heights on the leg Z, to the point of sight; which again must be squared over to the leg D: all that remains is then to be done by hand; reducing your draught as near as possible to the finished design, as shewn below at fig. 4. Remark that where the term diagonal is mentioned, it refers to those lines that are drawn to the point of distance.

Plate 7.

To represent a Secretaire Desk and Bookcase in Perspective, from a given plan and profile.

The figure marked B, represents the plan of the bookcase; where W W, W W, denotes the length and depth of the lower carcase, corresponding with the depth marked W W, in the profile C: Y W, denotes the depth of the upper carcase, answering to Y W, in the profile. The dotted line X X, shews the projection of the cornice round the top, being marked with the same letter in the profile. Z, Z, Z, Z, shews the projection of the base moulding round the lower carcase, as shewn in the profile by the same letters. H H, is the Horizontal line, G G, the Ground line, and D the point of distance for the bookcase, Fig. 1. The station or point of sight in this example is placed 17 feet and half an inch (by the scale) from the distance D. The first thing to be considered, is the position of the figure about to be represented, in regard to the station or point of sight; or in other words, the distance the nearest corner of it is from the point of view. In the present Example the point F on the ground line G G, has been chosen as the nearest corner of the object. The next thing to be performed is that of making the perspective plan (marked E) beneath the ground line; with all its parts and projections, the same as in the Geometrical plan marked B. This may be placed at any distance below the ground line, but in all cases the lower such plan is placed below the horizon, the more distinct will be the different intersections. Proceed and draw the line *a a*, under fig. 1, at pleasure; upon which set the length W W, of the bookcase (in the plan B,) from the nearest corner F; as from *v* to *b*, which will make the front line of the lower carcase. From *b* and *v*, draw visuals to the point of sight: next set off the depth (W W,) of the lower carcase, from *b* to *c*; this draw to the point of distance D: its intersection with the visual from *b* at *e*, will determine the perspective depth of the lower carcase. A line squared from *e* to *f*, parallel to *b v*, will complete the plan of the lower part. Next set off the measure W Y, (in the

PERSPECTIVE, PL. VII.



plan B) from *o* to *g*, which draw to the distance as before; its intersection with the visual *b e* at *t*, will determine the seat of the upper carcase: a parallel drawn from *t* to *i*, will represent the front line. It then remains to find the perspective projection of the mouldings, in the lower and upper carcases; which may be obtained as follows: set off the projection of the plinth, (marked W O, in the plan B,) from *b* to *o*, and *v* to *y*; which draw to the point of sight: a line thrown back from *b*, by the point of distance, will by its intersection with the visual drawn through *o*, give the projection of the plinth at *l*; and a line squared from *l*, intersecting the visual drawn through *y*, at *m*, will give the projection of the plinth at the furthest point from the spectator. The same process must be followed for finding the projection of the cornice in the upper part; observing to throw the mitre back from *t*; and thus the plan of the lower and upper carcases, with their projections and mouldings is found perspectively. Next square up the corner *b*, perpendicularly at pleasure, as at I; which line consider as the Geometrical line, upon which all the original heights of the figure must be placed: in this Example the heights are squared from the profile C, as numbered, 1, 2, 3, 4, 5, 6, 7, 8. From all these heights on the original line, draw visuals to the point of sight; not the whole length, but only as far as may be necessary to receive the intersections of the perpendiculars raised from the perspective plan. Having proceeded thus far, commence by raising a perpendicular from *t*, in the plan; this will intersect the visuals drawn from 4, 5, 6, 7, and 8, at the points *o*, *o*, *o*, *o*, *o*, and thereby, determine the heights of the cornice and frieze in the upper carcase. These heights squared to the perpendicular raised from the point *i*, in the plan, will complete the frieze; and also the bottom line of the cornice in front; giving likewise the base line of the upper carcase at K. The heights of the members on the lower carcase are determined on the original line itself at 1, 2, 3, and 4; from which visuals alone are required to be drawn; and these, as well as the visuals drawn from 5, 6, 7, and 8, in the upper carcase, are terminated by a perpendicular raised from *e*, in the plan: thus far the body of the bookcase is completed. The projecting members are found in the plan at the points *l* and *m*, for the plinth in the lower part; and *n* and *r*, for the cornice in the upper part. It only remains to throw mitre lines by the point of distance, from *o*, *i*, and F, which by their intersection with perpendiculars

raised from *n* and *l*, in the plan, will give the required height and projection of the cornice and plinth, as shewn by the letters *s*, *s*, *s*. Parallels drawn from these intersections and terminated by perpendiculars raised from *m* and *r*, will complete the figure. The profiling of the mouldings must be regulated by the Geometrical elevation, and drawn by hand, as shewn in the finished Example, fig. 2. The remainder of the finishings, viz. the pilasters, pannelling, framing the upper doors for glass, &c. will depend entirely on the taste of the designer.

Fig. 2, shews the same bookcase as finished in all its parts, with the addition of a Secretaire drawer thrown open for writing; which it was thought proper to shew in this figure, instead of fig. 1, for the purpose of keeping the latter diagram distinct and free from too great a mixture of lines. In all these articles of furniture, the lower or hinged part of the fall down front is placed about 2 feet 6 inches from the ground, and is generally about 9 or 10 inches in depth. To shew this drawn open and let down for the purpose of writing, commence and draw visuals by the point of sight, from C and D. Next set off the height of the fall down front, with the depth of the drawer when out, from D to *e*; this measure throw from the point of distance; its intersection with the visual D *g*, at *g*, will give the front of the writing flap. This squared to the visual from C, intersecting it at *f*, will determine the length of the flap. To obtain the place of the cheeks or sides, (X, X) of the drawer; set the measure of one of them (generally about 9 inches), from D to *i*; this measure thrown back by the point of distance D, upon the visual D *g*, at *h*, will give the seat of the nearest side X; which being squared on to the opposite visual from C, will give the seat of the furthest one at *m*. Perpendiculars raised from *h* and *m*, and cut by visuals from A and B, will determine their height. The seat and height of the quadrants for supporting the fall down front, are found after the same manner, as may be seen by inspection of the figure.

Remark, that the point of sight in fig. 2, is shewn at S; and the distance being the same from it as that in fig. 1, namely 17 feet and ½ an inch by the scale, could not be shewn in the picture; but its tendency is shewn by the dotted line marked F. In like manner the tendency of the point of sight in fig. 1, is shewn by the converging lines, making the top and bottom of the bookcase.

PERSPECTIVE Pl. VIII.

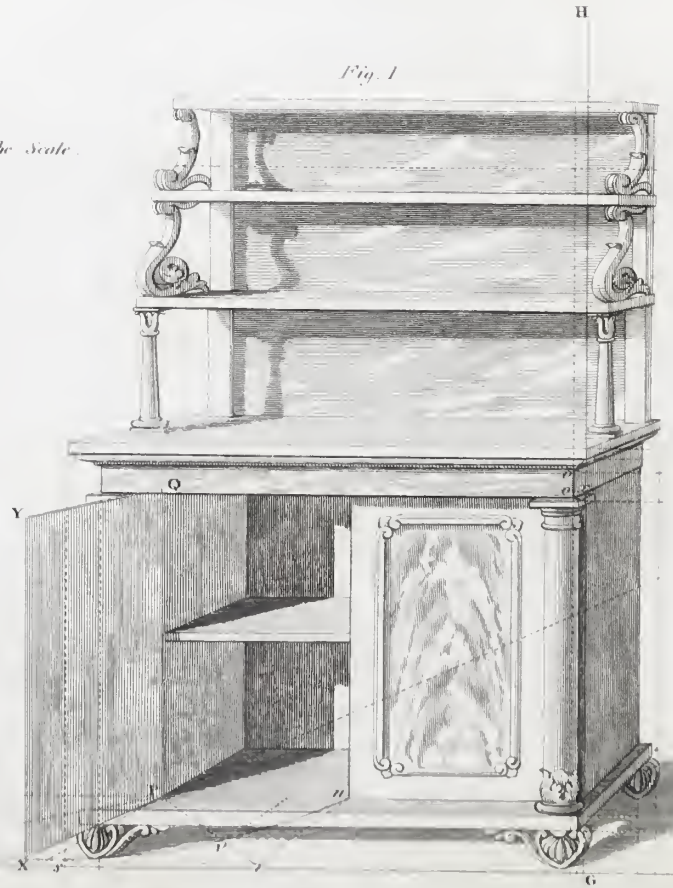
D H

Station Point Ft 13 In & ½ *from* D *by the Scale*
For Bookcase

Station Point for Bedsteps

S

Fig. 1



S H

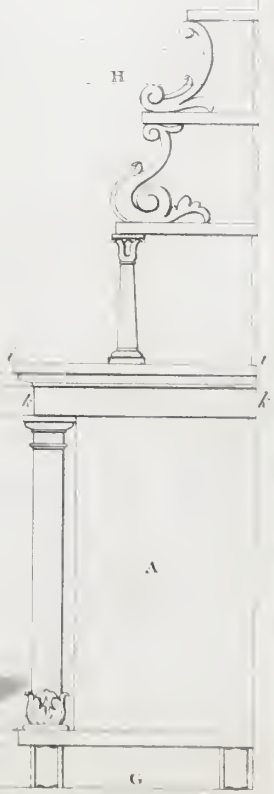
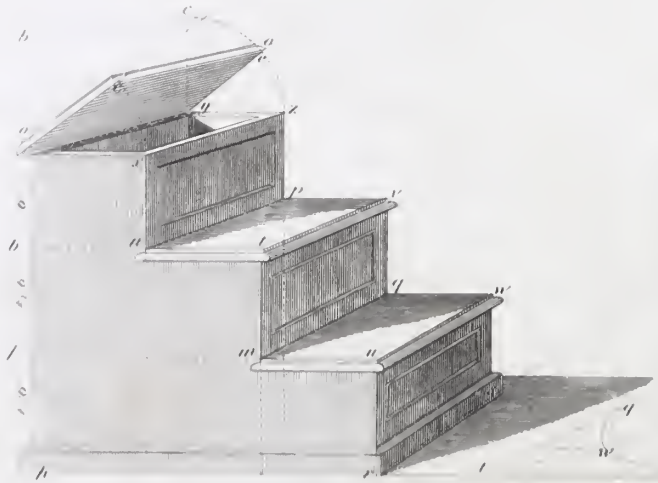


Fig. 2



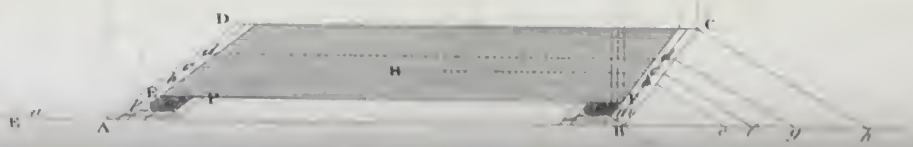


Plate 8.

To represent a Chiffonier commode (Fig. 1,) in Parallel Perspective, shewing the manner of representing a door open.

Let the Profile marked A be first made, agreeable to the size and proportion proper for such an article of furniture. From this construct the perspective plan marked B, after the same manner, and by the same process as that adopted for the bookcase in plate 7; the horizontal line H H; station point S; ground line G G, and distance D, regulated as before. The tinted circles marked *a a*, in the plan, denote the place of the columns supporting the frieze and marble top; the squares figured 1, 1, denote the capitals: E F, shews the front line making the body of the commode with the doors: A B C D, is the plan of the marble top. The dotted lines *b b*, *c c* and *d d*, shew the front lines of the shelves in the upper part (making the chiffonier;) which are got by setting off the breadth of each shelf in the profile, from *h*, (the back of the commode,) and conveying them on the visual B C, by the point of distance; as shewn by the lines *e b*, *f c*, and *g d*. The perspective plan being completed, proceed and draw the perpendicular line G H, from the corner B, in the plan; which consider as the Geometrical line, upon which to receive all the original heights from the profile. Commence by squaring, first, the height and thickness of the top *i i*, which being in the plane of the picture, must be continued direct to the perpendicular raised from A in the plan: this will determine its length in front. Next square along the height (top and bottom) of the frieze *k k*; which convey by the point of distance to the perpendicular raised from the corner *m* in the plan B, intersecting it at *o*, *o*. Parallels drawn from *o*, *o*, and continued to the perpendicular raised from *l*, will complete the frieze. The columns, shelves, &c. may be all obtained after the same manner; as may be seen by reference to the plate, it being needless to repeat over the same process a second time, as such would occasion a multitude of references which would only tend to perplex the figure. It is thought proper in this example to shew one door of the commode open, and at the same time to de

monstrate and lay down the principles by which it is performed. It is evident that every door turning on its hinges, would by its revolution, generate a semicircle equal in diameter to double the width of the opening. This semicircle being found perspectively, the door may be shewn open on any part of its semicircumference. Suppose the door to be hinged at P, and P *n* to be the width of the opening; continue the line P *n*, out at pleasure, upon which set off the width of the opening P *n*, from P to *q*; and throw visuals by the point of sight from *n*, P, and *q*: a line thrown from P by the point of distance, will by its intersection with the visual thrown from *n*, give the breadth of the half square, containing the semicircle, at *r*: a parallel drawn from *r* to *t* will complete the half square. Draw the semidiagonal P *t*. Next take little more than one seventh of the line *q n*, which convey upon the semidiagonals P *r*, and P *t*, by the point of sight, at *w* and *v*. The semicircle must then commence from the point *q*, and be traced through the points *w*, *s*, *v*, terminating at *n*. The semicircle being thus obtained, take any point on its circumference as X, for the extent you mean the door to be thrown open; a line drawn from this point to P, will make the bottom line of the door, which being continued to the horizontal line will there give the vanishing point for the door, as thrown open at this angle. A line thrown from Q, by the vanishing point, and cut by a perpendicular raised from X at Y, will give the upper line of the door. The point Q is found by squaring a line from *x* until it cuts the perpendicular drawn from P. The vanishing point for a door thrown open at any point upon the semicircumference of the circle may be found after the same manner; namely, by joining such point with the centre where the door hinges by a line, and continuing it to the horizon.

Remark, the distance of the vanishing point in this example is two feet two inches from the station point on the right hand, by the scale.

To represent a flight of Bedsteps, Fig. 2, in Perspective.

In this example the profile of the steps is shown parallel to the picture, and consequently would be Geometrical; save and except the projections of plinth and nosings. First set off the measure of each tread of the steps

(being 9½ inches) on the line *a a*, at A, B, C, and D; which draw to the point of sight. Next set off the width or front of the step (being 21½ inches) from D to E; this conveyed by the point of distance on the visual drawn from D, will give the perspective length of the front at F: a line squared from F to G, will complete the plan of the steps The lines B H, C I, and D F, will in this case be the seat of each tread. The projection of the plinth and nosings being the same, both are found as follows: set off the measure of the projection from A to *a*, and from D to *d*, from which draw visuals to S: Lines thrown from G and D, by the point of distance, where they intersect these visuals at *g* and *d*, will give the projection at the corners G and D. Lines squared from G and D, and cut by the visuals before drawn, will give the projection of the two opposite corners at *a* and *f*; this completes the plan. In raising the elevation, commence by drawing the perpendicular *h i*, from A in the plan; on which set up the height of each step from the ground line G G, as at *k*, *l* and *o*: these square to the perpendiculars raised from B, C, and D, intersecting them at *x*, *n*, *t*, *m* and *u*, which will complete the profile of the steps. Visuals drawn from *o*, *x*, *n*, *t*, *m*, and *u*, and cut by perpendiculars raised from H, I, and F, will represent the treads of the steps; the perpendiculars cut by them at *z p*, *v q*, and *w s*, forming the furthest extremities of the risers. The thickness of the nosings are set below the top of each step, and their projections squared up from the plan: the plinth likewise after the same manner, as is shewn by the dotted lines. In this example, the top of the upper step is represented as thrown up; the principle of performing which is applicable to all table tops or desks that have a sloping elevation. On *o*, as a centre, with a radius equal the width *o x*, describe the quadrant *x b*; likewise on *y*, with the radius *y z*, describe the quadrant *z c*; and draw the visual *b c*. If the lid or top be thrown up perpendicularly on its centre, its representation will be the dotted plane *b c o y*. But in this instance it has been thought proper to show the top only partially open; for which purpose any point in the quadrant *b x*, may be chosen, as at *c*; which being drawn to the centre *o*, will represent the nearest edge of the lid: this being continued until it intersects a perpendicular raised from the point of sight S, will give the vanishing point for the inclined position of the lid; to which the opposite edge *y e* is drawn. A visual drawn from *e*, in the quadrant *b x*, to *e*, in the opposite quadrant *c z*, will represent

the front edge; the nosing drawn round may be measured by those of the other steps.

It is necessary to observe, that the more or less the lid or top is elevated, so the seat of its vanishing point in the perpendicular vanishing line, will more or less vary.

Plate 9.

To represent a chair in Perspective, its side being seen in front, and its front being at right angles with the picture.

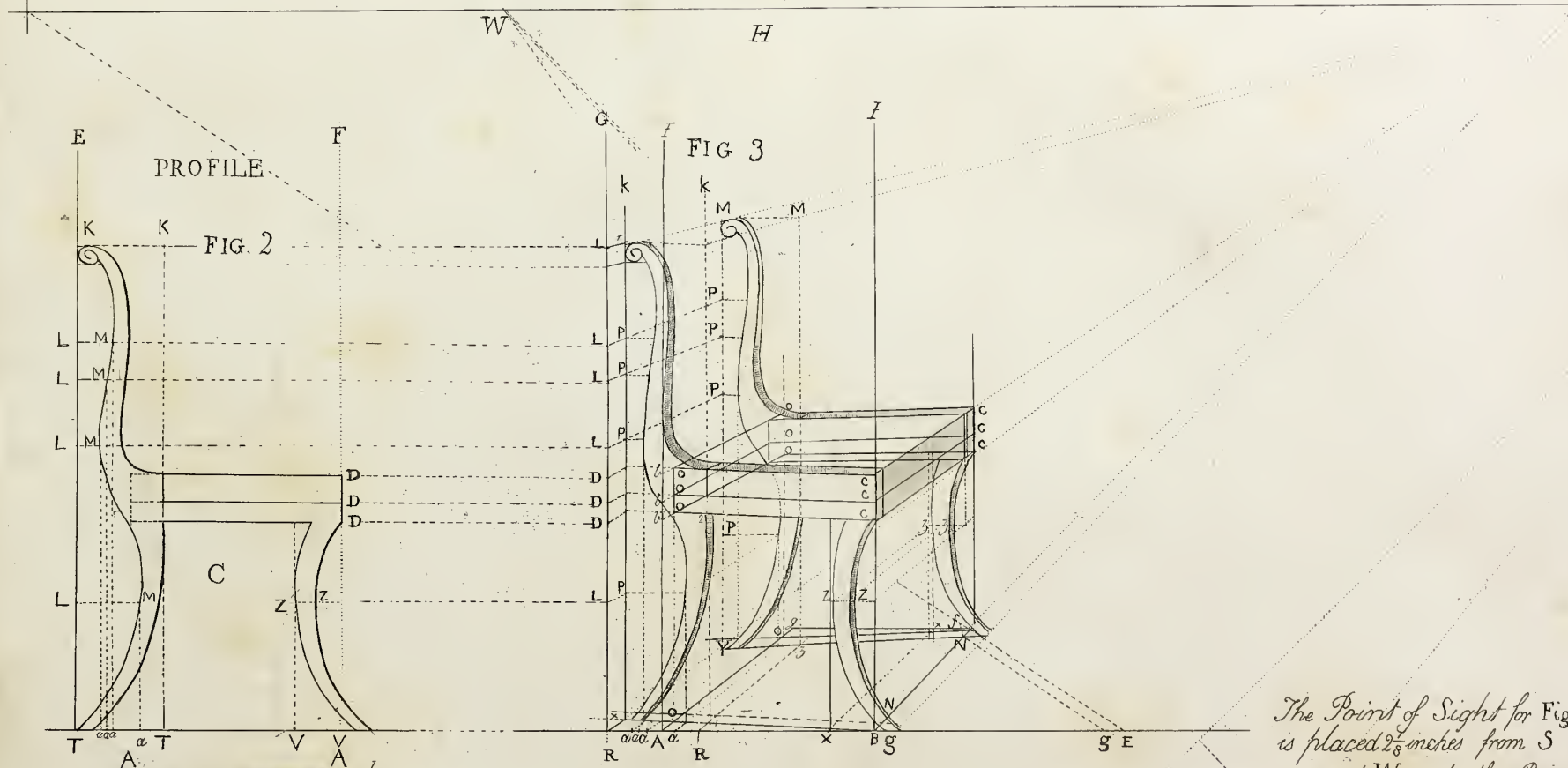
The back of all chairs being less than the front, it follows that the two side rails will form inclined planes; the one opposite in its direction to the other, which if continued would intersect each other somewhere below the horizon, and terminate in the horizontal line; the one to the right hand of the station or point of sight; the other to the left; but each equally distant from it; this is to be understood of a chair seen front ways, that is, whose front is placed parallel to the plane of the picture.

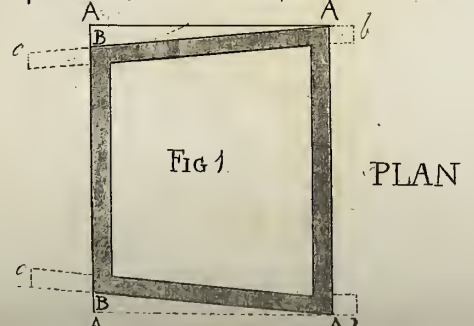
Chairs as they are placed in apartments, generally have their bevelled sides opposite to the plane of the picture; the vanishing points for such inclined sides would therefore be greatly beyond it, which sides if produced, would intersect the horizon at so great a distance, as to render the use in practice inconvenient; which can be avoided by adopting a different practice.

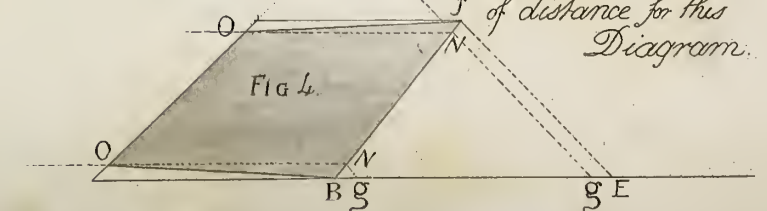
It is obvious then that there are two methods requisite for putting a chair into perspective; the one as relates to the view when taken in front, or when the front of the chair is parallel with the plane of the picture; the other when the chair is placed with its back and front at right angles with it; or in other words, when the bevelled side of the chair is immediately before us.

We shall give an example both ways, and commence with the side view in preference; giving a plan and elevation, with a scale, by which the whole is proportioned.

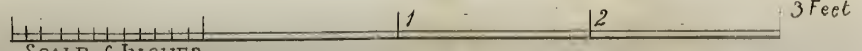
Perspective 9







The Point of Sight for Fig 4. is placed $2\frac{7}{8}$ inches from S and W made the Point of distance for this Diagram.



In the present example the plan of the chair seat is represented at fig. 1 : the letters A A A A, denoting the square in which the seat, with its bevelled sides A B and A B, is contained; thus, A A denotes the front rail of the chair and B B, the back rail; A B, and A B, are therefore the inclined sides of the seat rail common to all chairs: the spray of the front legs are denoted by the letters *b b;* those of the back by *c c.* The plan, fig. 1, being completed, and the profile C, fig. 2, constructed, proceed and transfer the depth (A A,) of the bevelled side of the chair in the plan, from A to B, on the ground line, fig. 3. Next set off the measure or spray of the back foot (B *c,*) from A to R: from R, A and B raise three perpendiculars ; B I, to receive the heights for the front rail of the chair, and A I for those of the back rail; also R G to receive the height of the top yoak, the spray, or any other division of the back. Transfer, or square from the elevation C, the different heights (D D D,) of the rail and stuffing, at D D D, on the line R G; at *b, b, b,* on the line A I; and at *c, c, c,* on the line B I; and transfer the spray *b b,* of the front seat in the plan, from B to *g.*

From R, A and B, draw visuals to the point of sight: next set off the width of the chair, (A A in the plan) from B to E; this convey to the visual B S, by the point of distance D, intersecting it at *f.* From *f,* draw a line parallel to the ground line, intersecting the visual A S at *g;* this will complete the square containing the seat of the chair.

For the bevel of the sides, set off the measure B A, in the plan, from B to *g,* and from E to *g,* on the ground line; which measures convey on the visual B S, by the point of distance D, intersecting it at N and N. From N and N, square lines across to O and O, as shewn in fig. 4. Join B *o,* and *f o,* which will give the two bevelled sides, and complete the perspective plan of the seat. These lines continued will receive the spray of the back legs. Next from *b, b, b,* on A I, draw visuals at pleasure tending to S ; and from *o* and *o,* in the perspective plan raise perpendiculars until they intersect the visuals drawn from *b, b, b,* at *o, o, o,* and *o, o, o ;* likewise from *c, c, c,* on B I, draw visuals to S, which terminate by a perpendicular from *f* at *c, c, c ;* draw the lines *c o, c o, c o,* and *c o, c o, c o ;* which will make the lines of the side rails and stuffing.

To obtain the height of the back, first raise perpendiculars from *x* and *y,* on the visual R S ; as *x k,* and *y* M. From K in the profile C, square the

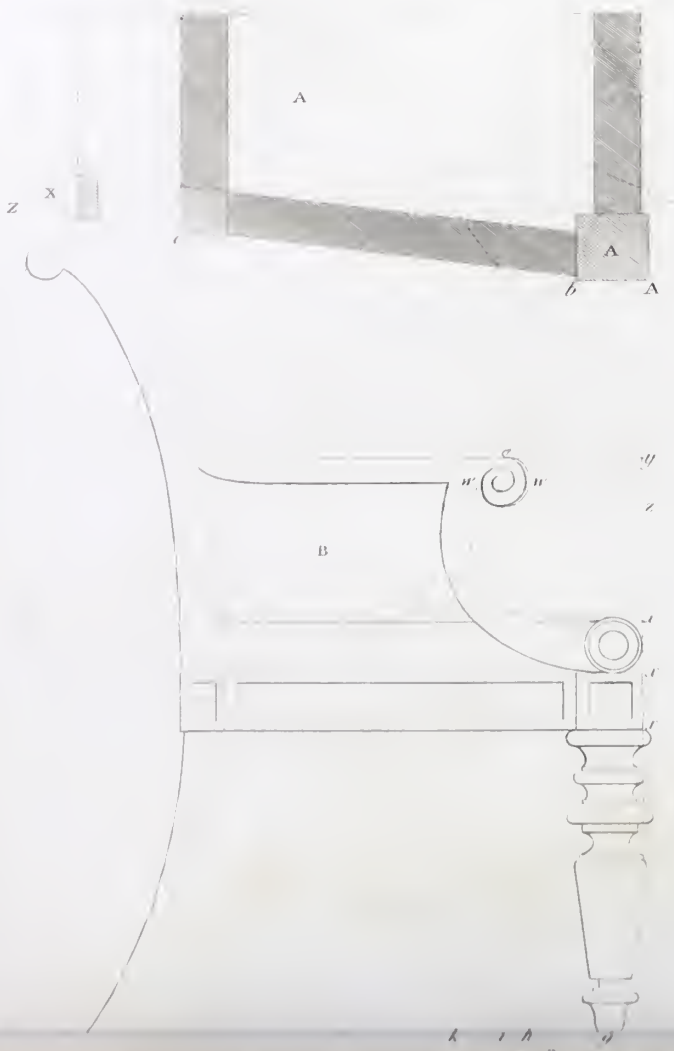
height of the back to the perpendicular R G, at L; this draw to the point of sight S: its intersection with the perpendiculars *x k* and *y* M, at *t* and M, will give the height of the back. The sweep of the back may be found by dividing the height T K, (in the profile, fig. 2,) into any number of parts; as at L, L, L, L: from these divisions draw lines until they intersect the outline of the mould at M, M, M, M. From M, M, M, M, drop perpendiculars, intersecting the ground line T V, at *a*, *a*, *a*, *a*. Next square the divisions L, L, L, L, to the perpendicular line R G, as at L, L, L, L; and draw visuals tending to S, until they intersect the lines *x k* and *y* M at P, P, P, P, and P, P, P, P.

Transfer the measures *a*, *a*, *a*, *a*, (in the profile,) to the ground line fig. 3, from R to *a*, *a*, *a*, *a*, as lettered; these convey on the bevelled lines B *x* and N *y* by the point of sight S; from these intersections, perpendiculars must be raised until they meet, each its corresponding line, squared from P, P, P, P; by this means points will be produced, through which to draw the outline making the sweep of the back: these lines form, the one an outside sweep, and the other an inward. For the inside of the back foot, set the measure T T, (in the profile fig. 2,) from R to R, fig. 3; this draw to the station S, intersecting B *x* at 1, and N *y* at 3: perpendiculars raised from these points will give the springing for the inside of the back leg, on the rail at 2, and on the opposite rail at 4; the two sweeps may then be drawn by hand; the thickness of these legs may be drawn near enough by the eye in small examples. For the front legs, the sweeps are contained within the space Z Z, in the profile: this measure is then tansferred from B to *x*, and conveyed by the point of sight on the opposite side at *x*. Perpendiculars raised from these points and intersected by a line squared from Z Z, (in the profile) at Z Z; and by visuals drawn from Z Z at *z z*, will give points through which the sweeps may be drawn. To give every point and line necessary to the perspective construction of such an example, would only perplex the student; more lines are now given than has hitherto been attempted in other works of this kind, but we have chosen to be thus particular in this and the following example, convinced that those who wish to learn and know the reason for that which is laid before them, will not be discouraged to go through the references, although apparently numerous.

Fig. 4, is introduced for the purpose of shewing the manner of finding the perspective representation of the seat on a larger scale.

PERSPECTIVE X.

Point of Distance 8 Feet from S. by the Scale



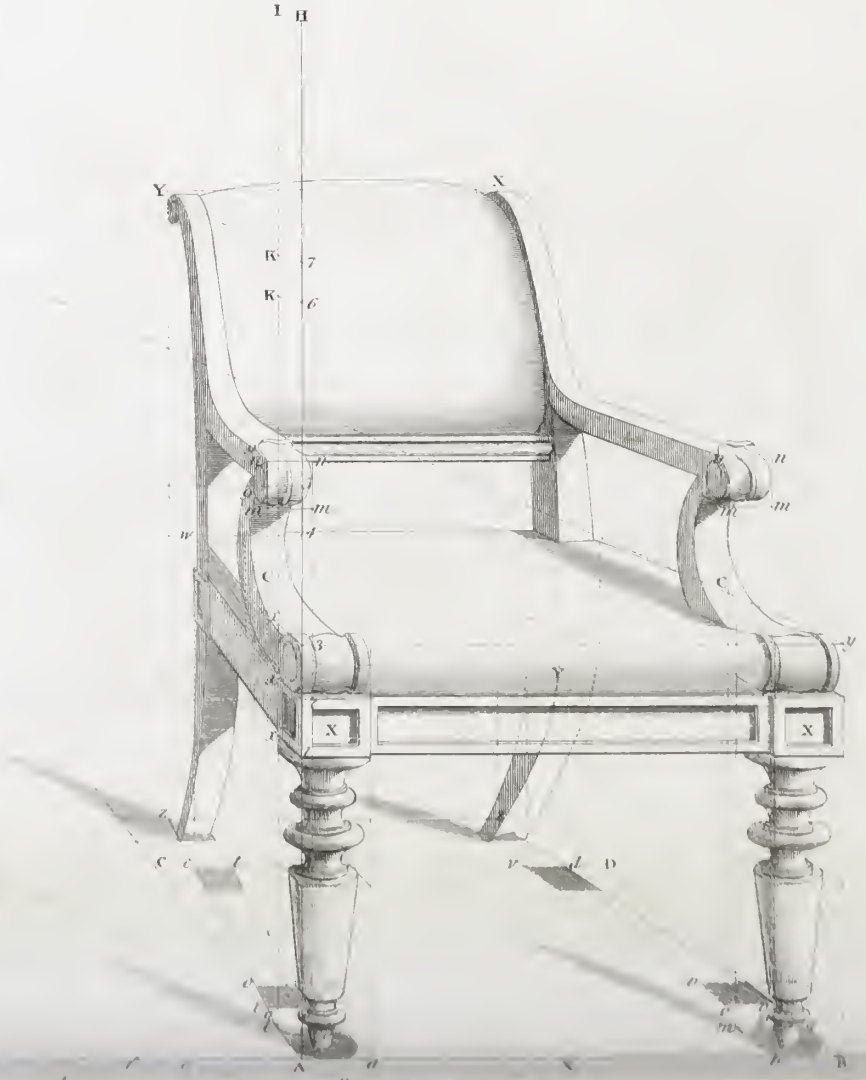


Plate 10.

To represent an elbow chair in perspective, the front being placed parallel to th picture.

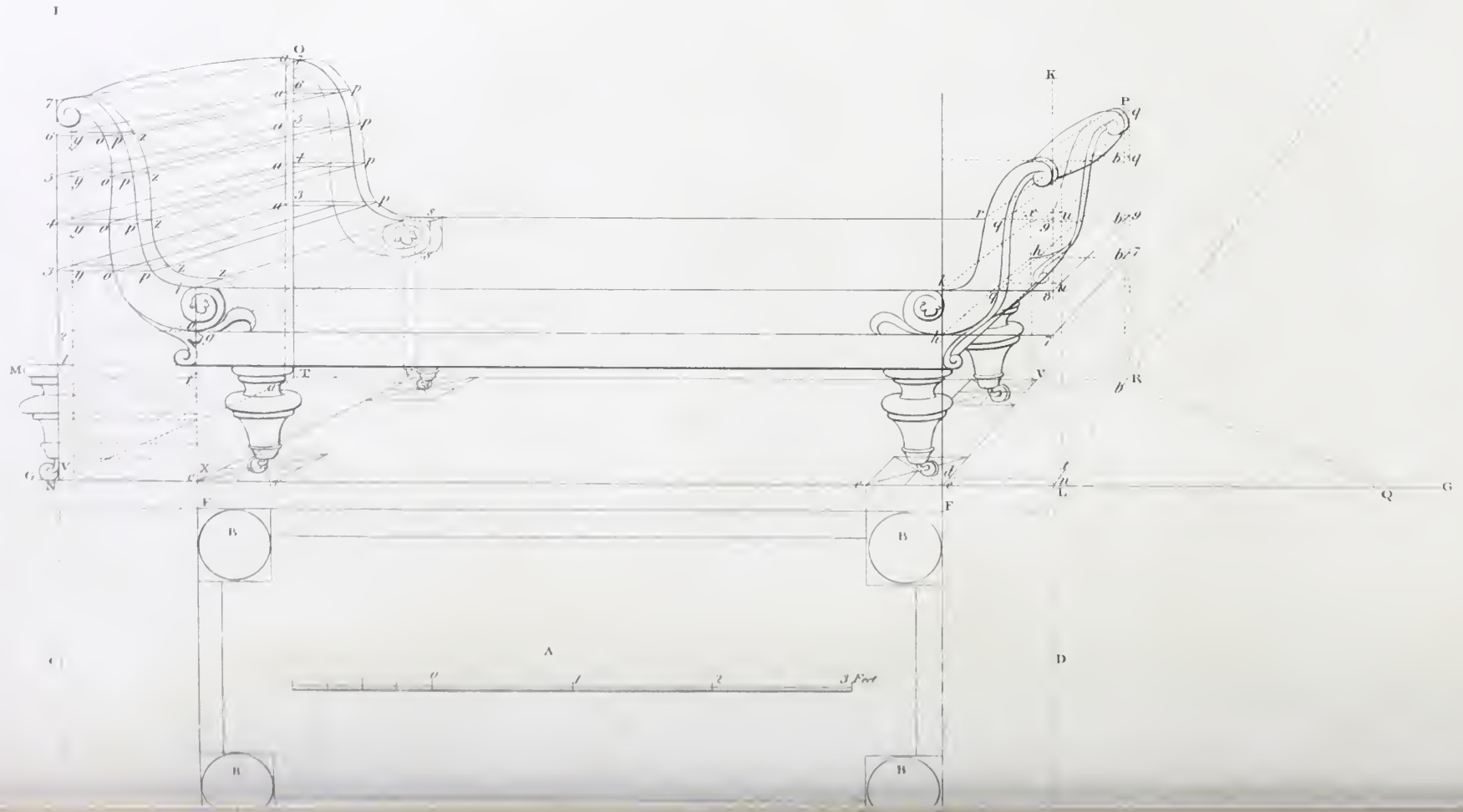
Having constructed the plan and profile by scale as before, and determined on the points of sight and distance; commence by setting the measure of the front rail of the chair (from the plan A,) on the ground line G G, as A B; from which draw visuals to S. Next set off the depth of the side rail from A to *g;* this conveyed on the visual A S, by the point of distance, will give the perspective depth of the rail at C; from which draw a parallel line, terminating it on the opposite visual at D. Next proceed and take half the measure of the back rail, and set it right and left from the centre X of the front line A B; this convey on the back line C D, by the point of sight, intersecting it at *c* and *d;* the line *c d* will then represent the width of the back rail. Set the width of the square A (in the plan) from A to *a*, and from B to *b;* these draw to the point of sight S; a line drawn from A to the point of distance, where it intersects the visual from *a*, will give the depth of the square; this transferred to the visuals from A, *b*, and B, will complete the two squares containing the front legs: join *b c* and *q d*, which lines will make the two bevelled sides, and these continued to the horizontal line H H, will there give the vanishing points for the bevelled sides at V 1, and V 2. From A, *a*, B, *b*, *l* and *m*, raise perpendiculars; and consider the perpendicular A H as a Geometrical line, upon which to receive the heights from the profile B. First square or transfer the heights *(x, x, x,)* of the rail and stuffing to the Geometrical line A H, at 1, 2, and 3, which continued across to the perpendiculars raised from *a*, *b*, and B, will give the front Y, of the stuffing, with the two knees X, X, of the front legs. Lines drawn from 1, 2, 3, to the point of sight S, and received by the perpendicular from *l*, at *x, x, x,* will make the return of the knee X, and give the plane for the scroll of the arm at the nearest corner: lines drawn from *x, x, x,* to the vanishing point V 1, and received by the perpendicular raised from *c*, will give the representation of the bevelled side of the rail and stuffing: likewise a line drawn

from *y*, to the vanishing point V 2, and terminated by a parallel squared from *w*, will complete the seat of the chair. To obtain the place of the elbows, set off the distance they recede from the front line *y x*, (of the profile,) from A to *e ;* this convey on the visual A S, by the point of distance : its intersection at *r*, will determine the place of the elbows, which must be squared across to the lines *l c*, *o t*, *p v*, and *q d*, intersecting them at *o o*, and *o o ; o o* and *o o* will then become the front lines for the upper scrolls. The depth *w w*, in the profile must next be set from *e* to *f ;* conveyed on the visual A S, and be squared across as before mentioned ; being denoted by the tinted planes. From *o*, *o*, *o*, and *o*, *o*, *o*, raise perpendiculars ; next square the height *y* of the elbow, and thickness *z* of the scroll, to the Geometrical line A H, at 4 and 5 : lines drawn from 4 and 5, to the point of sight, received by the perpendicular *l* I, and from thence conveyed by the vanishing point V, to the perpendicular *o x*, will give the perspective height of the elbow, and thickness of the scroll at *n* and *m ;* and its return at *g*, *g*. Lines squared across from *n* and *m*, and received by perpendiculars from *o*, *o*, and *o*, *o*, at *n*, *m ; n*, *m*, and *n*, *m*, will give the planes for turning in the scrolls. Having thus obtained the planes for the top and bottom scrolls of the two elbows, the sweeps C, C, may then be drawn by hand. It were possible to give lines and points, whereby the sweeps C, C, might have been found; but this would have occasioned much complexity of lines, and taken up much of the student's time to very little purpose. The elbows being drawn in, proceed next with the back of the chair ; first by finding its seat Z Z, in the perspective plan below, as before directed ; the distance of which from the front line of the chair is denoted in the plan A, by A Z, and set on the ground line from A to k. The height and thickness of the scroll of the back, must next be squared from the profile B to the Geometrical line A H, at 6 and 7 ; this convey first on the perpendicular *l* I, by the point of sight at K, K, and thence by the vanishing point V 1, on the perpendicular Z Y at Y; this will determine its perspective height; which must be squared across to X : the outline sweep of the back may then be drawn by hand. The directions given in the preceding plate for finding points to obtain the outline of the back, will also apply to this example ; as likewise for the sweep of the elbows. The front legs are denoted on the perspective plan by the tinted circles contained in the squares *l* A *a*, and *m b* B ; the diameters of which will regulate the

PERSPECTIVE XI.

H S

Distance 11 Ft. 4 In. from Point of Sight S, by the Scale



projections of all the upper mouldings, whose heights must be squared from the profile as before. The taper of the legs may be found by adopting the process as described in plate 6, for those of the table: to repeat the process here would be needless. For the back legs set off the measure A X, (in the plan) from A to *i*, which convey on the visual A S, by the point of distance, and square it to the bevel lines *l* Z and *q* Z, as before; which will be seen by reference to the figure.

Plate 11.

To represent a Grecian chaise longue, or Sofa in Parallel Perspective.

In order to render this lesson explanatory and easy of comprehension, it is thought necessary here to lay down the plan, A, by a scale suited to the size the object is intended to appear. Thus, E F F E, denotes the frame or seat of the sofa. The dotted lines C and D, shew the head and foot scrolls; B, B, B, and B, shews the situation of the four legs; the squares of which are denoted by the letters E E and E E; thus far, all will be ready for practice. Next determine your ground line G G; also your horizontal line H; likewise the point of sight S, and the point of distance (here out of the picture) on such line. Let L, (on the ground line G G,) as squared up from the line D in the plan, be that end of the object, nearest to the spectator. On L raise the perpendicular line L K; next square up the line C upon the ground line at N, and raise the perpendicular N I; these two perpendiculars (L K and N I,) will receive all the original heights, (or geometrical measures:) for this object being placed parallel to the plane of the picture, and the front side in the directing plane, (or plane passing through the eye of the spectator, as explained in page 70) such side would in this case be geometrical. Proceed and square up the points F and F from the plan, upon the ground line at *e* and *e*; also the squares E E, and E E, of the legs, at *e e* and *e e*. On the extreme ends, *e* and *e*, raise the perpendiculars *e k* and *e i*, at pleasure; these lines limit the geometrical length of the frame, and determine the place of the legs or feet. Being thus far advanced, proceed and make a profile of the leg as at M; the mouldings of which must be

squared to the perpendicular *e f*, as shewn by the dotted lines. On N I set up the heights N I and 1-2, of the under and upper parts of the rail; which square across to the lines *e i* and *e k*, at the points *f—f* and *g—h*. On the same lines set up the thickness of the stuffing at *i*, and draw the line *i k*. Next set up the height you intend the head scroll to be. It will then be necessary to draw the scroll agreeable to such outline as you mean it to take; which must be geometrical, and is here marked by the letters *o, o, o, o, o*. The foot scroll must also be drawn geometrical after the same manner, as denoted by the letters *h, q, q, q*. For the purpose of obtaining the scrolls on the opposite side, which are perspectively reduced at O and P, it will be necessary to divide the scrolls at I and K, each into a certain number of parts: the scroll I at 3, 4, 5, 6, and 7; the scroll K at 8 and 9. On I draw the lines 3—o, 4—o, 5—o, and 6—o, intersecting this larger scroll at *o, o, o, o*: the same is to be performed as regards the lesser scroll, by squaring the points 8 and 9, to *q* and *q*. The inside outline of both scrolls must next be drawn; that at I, through the points *p, p, p, p*, terminating with the seat at *i*: that of the smaller scroll at K, is to be drawn through *r*, finishing with the seat at *k*: so far the geometrical figure will be completed. The next point is to obtain the width E F, (of the chaise longue in the plan.) Proceed and draw visuals from N, *e, e, e, e*, and L on the ground line, to the point of sight S. Next set the depth E F, of the chaise longue, from L to Q, which convey on the visual L S by the point of distance, intersecting it at R. This measure must be squared to the visual N S at the point T, intersecting the visuals *e* S and *e* S, at V and V. On R, V, V, and T, raise perpendiculars: viz. T O to receive the divisions 3, 4, 5, 6 and 7, (on N I,) by visuals, at 1, 2, 3, 4, 5, 6, and 7; R P, to receive the divisions 7, 8, 9, and *q*, on (L K) at 7, 8, 9, and *q*; V and V to receive those marked *i, o*, on *e*, and *k h*, on *e*, at *s s*, and *x h*. Lines squared from the divisions 3, 4, 5 and 6, on T O, until they intersect visuals drawn from *p, p, p* and *p*, on the front scroll, will give points through which to draw the outline of the back scroll from O to *s*: likewise lines squared from the divisions 7, 8, and 9, on R P, until they intersect visuals drawn from *q, q, q*, on the foot scroll, will give points through which the outline of the footscroll P, may be drawn. To obtain the thickness of the two scrolls, set such thickness from L to *n*; which draw to the point of distance, intersecting L S at *t*; which must

be squared across to the visuals *e* S, *e* S and N S, at *d*, *x* and *v*. On *v* raise a perpendicular, intersecting the visuals drawn from 3, 4, 5 and 6, at *y*, *y*, *y*, and *y*. Draw visuals from *p*, *p*, *p*, and *p*: Lines squared from *y*, *y*, *y*, and *y*, will intersect these visuals at *z*, *z*, *z*, and *z*; through which points, the outline making the thickness must be drawn. What has been thus performed for the head scroll, may be done for the foot scroll; as shewn by the planes *q* 8 *w* and *q* 9 *w*.

The thickness of the head and foot scrolls at the opposite side is found by raising a perpendicular from *a* on the visual N S, and from *b* on the visual L S. Visuals drawn from 3, 4, &c. and 8, 9, &c. will intersect these two perpendiculars at *a a*, &c. and *b b*, &c. Lines squared from *a*, *a*, *a*, and *a*, —*b*, *b*, and *b*, and intersected by the visuals drawn from *p*, *p*, *p*, and *p*; *q*, *q*, and *q*, will give so many points, through which to draw the outline making the thickness, as shewn by the tinted planes. For the legs B, B, B, and B, in the plan; their perspective appearance is obtained by forming perspective squares; as at *e e* and *e e*, V and V; the diagonals of which, will by their intersections, produce the four axes or centers. The directions given for drawing the turned legs of the chair in plate 10, will likewise apply to this, to which the student is referred to avoid repetition: what else is required in any design of this kind may be drawn by hand, near enough to answer every purpose. Quite sufficient has been done in this example to enable the student to put any sofa or chaise longue into perspective, the same principle extending to all, however various in shape.

Plate 12.

To represent an occasional Table in Perspective, its front being parallel to the picture.

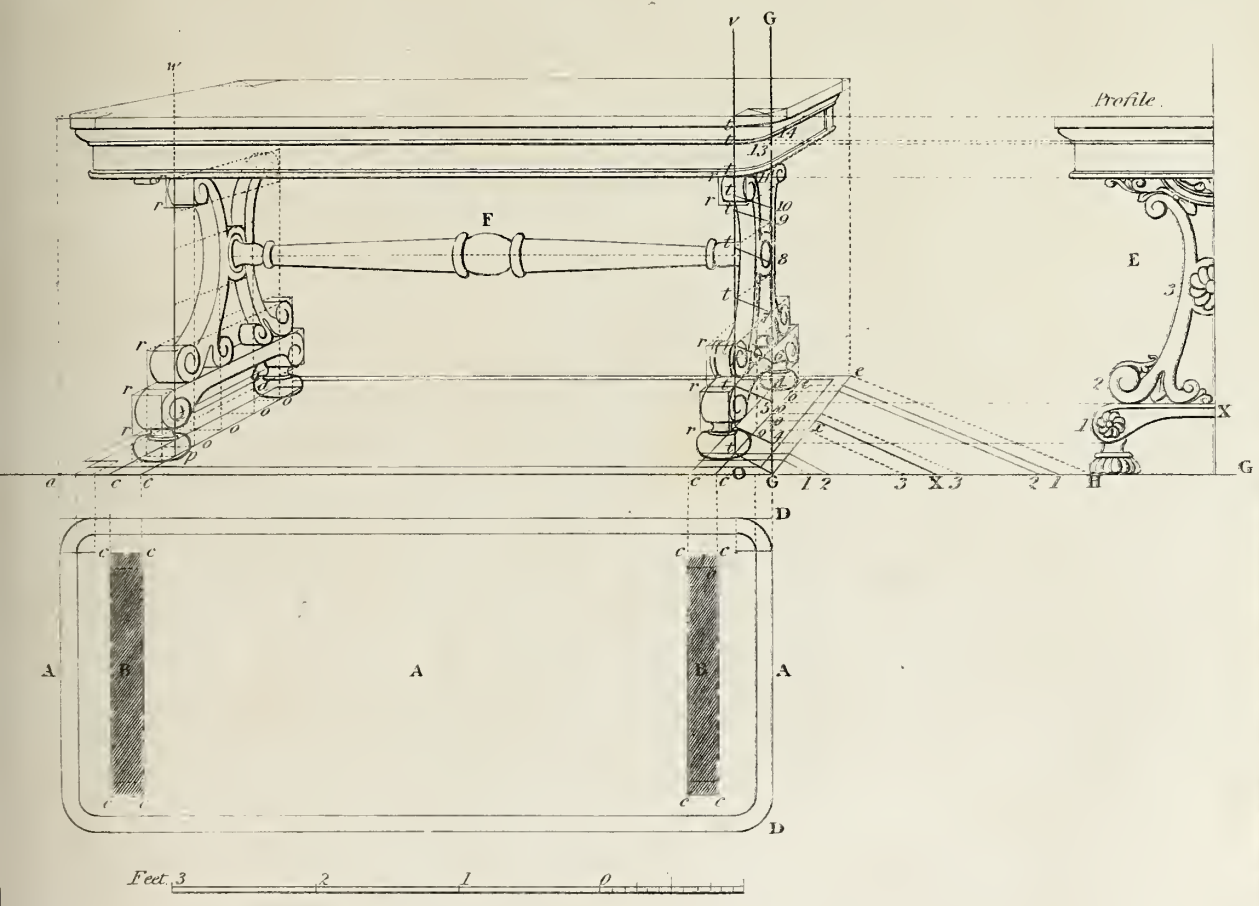
Construct the plan A A A, of the top, with the blocks B B, supporting it; likewise the profile E, as directed in plate 6. Make G G, the ground line; H, the Horizontal line; S, the station or point of sight; and let the point of distance be placed on the horizontal line 11 feet 5 inches, (by the scale) from the station point S. Thus far prepared, square up from the plan, the length (A A,) of the top, to the ground line at the points *a* and G;

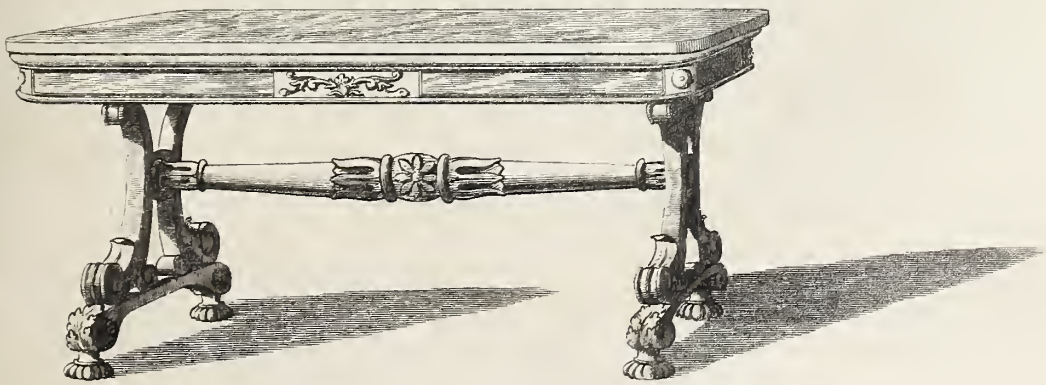
likewise the seat of the blocks C C and C C, to *c c* and *c c*, on the same line. Raise a perpendicular from G, which consider as a geometrical line, on which to place all the original heights from the profile E; as shewn by the dotted lines. From *a* and G, (on the ground line) draw visuals to S; as also from *c c*, and *c c*. Next set off the width D D, (of the top in the plan) from G to H, which convey on the visual G *e*, by the point of distance; this squared to the visual from *a*, will complete the perspective plan *a b e* G of the top. To obtain the situation of the frame under the top, as shewn by the inside plane, the learner is referred to the table, plate 6, where he will find the whole amply explained. Divide G H into two equal parts as at X: a line drawn from X to the point of distance, will give the centre for each standard on the visual G *e* at *x*. From the centre *x* of the profile E, take all the different projections making the outline of the standard (as marked 1, 2, 3,) and set them from X, at 1, 2, 3, and 1, 2, 3, right and left on the ground line; which measures convey on the visual G *e*, by the point of distance, as before; these points squared to the visuals, drawn from *c c* and *c c*, will determine the seat of the projections (marked 1, 2, 3, in the profile,) in the perspective plan, at *o, o, o, o*, &c.

Commence and square from the profile, the height of the top, and depth of the frame under it, to the geometrical line G G; which draw to the point of distance; and proceed with the rest, as described in the table, plate 6. The situation of the standards, with all their component parts are thus obtained: square the heights (marked 1, 2, 3, &c. in the profile,) to the geometrical line G G, as denoted by the figures 4, 5, 6, &c. to 11; which convey on a perpendicular raised from O in the perspective plan (corresponding with *o* in the geometrical plan), at the points *t, t* &c.; these square to the opposite perpendicular *p w*. From all these heights on the perpendiculars O *v* and *p w*, draw visuals to S, until they intersect perpendiculars raised from *o o*, &c. in the plan; these will determine the different heights and projections for both standards, by which to regulate the outline as shewn in the profile. The thickness of the standards at top and bottom is regulated by the planes *r, r, r*, &c. on both sides; which are likewise squared up from the perspective plan. Figures 8 and 9, will give the situation for the stretcher F, or tye of the table frame. For the rest the pupil is referred to the directions given in the preceding examples; it is needless to go through a repe-

PERSPECTIVE XII.

Distance 11 Ft. 5 In. from Station S, *by the SCALE.*





tion of the process, as the student will in this example find all the necessary lines laid down, which by a little attention he will find to correspond with those at the opposite end, either by figures or letters. The projections being thus correctly obtained, the pattern of the standard, as shewn in the profile, is to be drawn by hand, as recommended in the preceding lessons. The shadowed example below exhibits the same table divested of the perspective lines, to give the learner a more distinct idea of the pattern.

Plate 13.

The plan and profile of a circular loo table being given, to represent the same in parallel perspective; having a turned column on a triangular block for its support.

It will be necessary first to make a correct plan of the table; viz. its circular top, which must be comprised within a square equal to its diameter, for the purpose of obtaining the Diagonal points on the circle; as marked X, X. Within this circle is placed the block, whether triangular or of a square figure. If triangular as in the present instance, the method for obtaining such will be found amply detailed in plate 4 Geometrical figures, page 51, to which the reader is referred.

The semicircle F X G X H, denotes one half the plan of the table top; the sine circle within this, denotes the situation of the rail under the top; the dotted semicircle K L M, bounds the triangle, in which is formed the block: the semicircle N U O W P, inscribes the ornamental moulding H, in the profile, and the semicircle E, denotes the diameter of the pillar at G, in the same profile.

Having inscribed the circle in a square, draw the diagonals B E and D E, intersecting the circle at X and X: you have then four points out of eight for obtaining the perspective circle: that is, supposing the whole of the plan was shewn complete, of which arc half is only given in the plate before us, for want of room. As all the other references relate to the operative part of the circle, to say any thing farther as regards them in the plan would be needless: we shall therefore proceed to the operation. Having as before,

determined the Ground line and the height of the Horizontal line, with the station or point of sight S; as also the point of distance, (in this example out of the picture,) you must first make a perspective plan at any distance below the ground line: For the lower it is placed below the horizon, as has been before observed, the more distinct will be the intersections of the lines.

In this species of table, the block of which is triangular, it may be necessary to say something as to the choice of the point of view. It will in all cases be most advisable when the block is triangular, to regulate your view so as to have the apex of the triangle to appear in front, or directly in the centre; by which means its figure will be better made out, and convey a more distinct idea of its form.

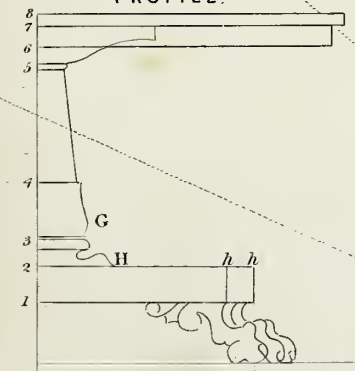
Let the line O O, be placed any distance below the ground line at pleasure; on which line lay down the width or diameter of the top of the table (as taken from the plan) from A to B; taking care that the centre F of this line be placed perpendicularly under the station S. From A and B draw visuals to S, and complete the perspective square A B C D, as shewn in the diagram, plate 2, page 79. Draw the opposite diagonal A D; also the lines F H and I G; you have then four points for turning in the ellipsis or perspective plan of the table top. Take the distance D *x*, from the plan in the compasses, and set it on the line A B, from A to *x*, and from B to *x*; visuals drawn from *x* and *x*, intersecting the diagonals A D and B C, at X, X, X, and X, will produce four other points through which the ellipsis may be described. The measure G *i*, in the plan, is next set off on the line A B from A to *i*, and from B to *i*, in the perspective plan. Visuals drawn from *i* and *i*, to S, will intersect the diagonals A D and B C at *r*, *r*, *r*, and *r*, and thereby produce a square circumscribing the ellipsis, making the frame under the top of the table. The measure D *y* in the plan, is next set off on the line A B, from A to *y* and from B to *y*; visuals drawn from *y* and *y*, intersecting the diagonals A B and C D, at *y*, *y*, *y*, and *y*, will give the four diagonal points, through which to trace the inner circle:—the four central points are seen by the intersection of the lines I G and F H, at *w w*, &c. To find the situation or place for the block *g* R *h h* P, (in the plan,) transfer the measure *l h*, right and left of the centre F, on the line A B at the points l and l: from these draw visuals to S. Likewise

PL. CXII.

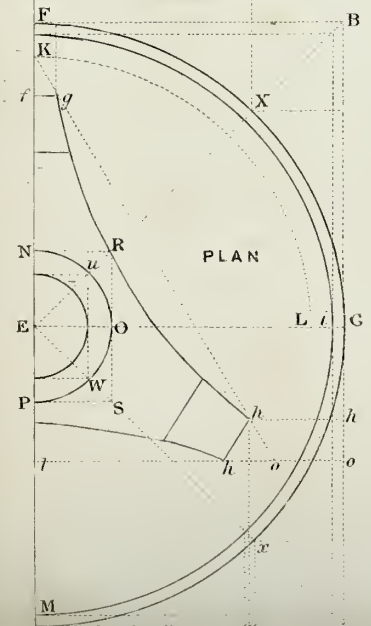
HOR. POINT of DISTANCE is 11ft 11in from the S POINT of SIGHT by the SCALE. HOR.

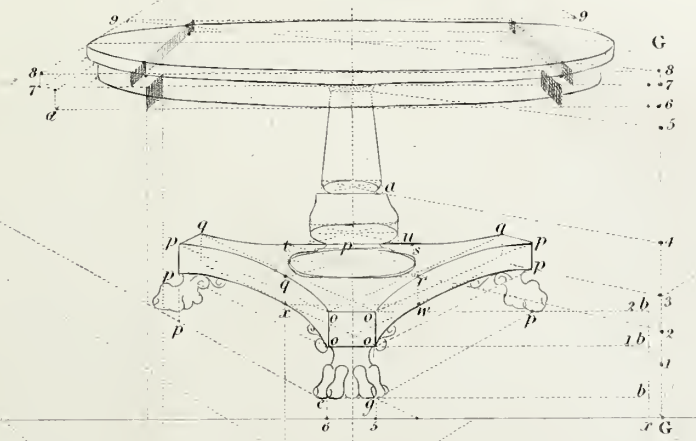
PERSPECTIVE. XIII.

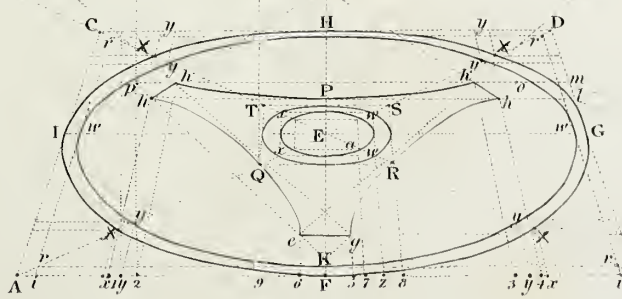
PROFILE.



DIST.







transfer the measure *f g*, from F to 5 and F to 6. Next take the measures F *f*, B *h*, and *h o*, and set them from B to *c*, from B to *d*, and from *d* to *f*; these convey on the visual B D by the point of distance, intersecting it at *m*, *l* and *b*. Lines squared from *m* and *l* and intersected by the visuals drawn from 1, 2, and 3, 4, will give the two canted sides *h h* and *h h*; also a line squared from *b*, intersecting the visuals drawn from 5 and 6, will produce the canted corner *e g*. The points *e h* and *g h*, being joined, and continued to the Horizontal line, will there produce the vanishing points for the inclined sides of the triangle, of which one is shewn in the plate at V, to which the canted side *h h* would tend; the tendency of other vanishing points being shewn by the dotted lines V and V. The square Q R S T, and the one within marked E are found by setting the corresponding measures E O. &c. in the plan, from F to 9, from F to 8, and from F to 7, which measures are conveyed on the diagonals A D and B C by visuals as before. The intersection of the visuals 8 and 9, with the diagonals, will give the points R and Q; likewise the intersection of the visual from F, with the line squared from *l*, will produce the point P, answering to P in the plan: through these points, R, Q and P, the sweep lines of the block may be traced. For the pillar, the circle contained in the square Q R S T answers to the circle N O W P, &c. in the plan, and denotes the situation of the moulding H in the profile, making the base of the pillar: the inside circle E, also answers to that marked E in the plan, and determines the greatest diameter of the pillar in the profile at G. We have thus been particular in describing the process for obtaining the perspective plan for a table of this kind, which being well understood, will render other objects less difficult of comprehension. The next step is that of putting the profile or elevation into perspective; in doing of which, the perspective plan will be found of considerable service. First raise a perpendicular from the point B in the perspective plan: this becomes a geometrical line upon which to receive all the original heights from the profile, and is here marked G G. Commence and transfer the heights 6, 7 and 8 from the profile, to 6, 7 and 8, on the geometrical line G G. From 8 on the geometrical line, square the line 8-8, which make equal to A B in the plan below: from 8 and 8 draw visuals tending to S; lines drawn from 8 and 8 to the points of distance, will intersect these visuals at 9 and 9, and

complete the perspective square of the top. The eight points through which to draw the ellipsis, are squared up from the corresponding points in the perspective plan. For obtaining the thickness of the top, a line must be squared from 7 to 7; and for the depth of the rail, a line must be drawn from 6 to the point of distance, intersecting a perpendicular squared from *r* in the plan; from thence squared across, and terminated by a perpendicular squared up from *r* on the opposite corner, intersecting it at *a*. The planes producing the points, through which to describe the two ellipses making the thickness of the top and depth of the rail, are squared up from the points X, X and *y*, *y* in the plan; for further instruction, the student is referred to plate 5, fig. 6, No. 1 and 2, page 89. To obtain the representation of the block, proceed and raise a perpendicular from *b*, in the plan up to the ground line at *x*, upon which to receive all the perspective heights forming the thickness of the block, and place for the front foot. Square from the profile to the line G G, the heights 1 and 2; these convey on the perpendicular from *x* by the point of sight S, at *b*, *b* and *b*; lines squared from these points determine the perspective height of the front foot, likewise the thickness of the block at the canted corner *e g*. Lines squared up from *e g*, in the plan, will intersect these lines so squared, at *o o*, *o o*, and produce the canted corner as seen in front, and give the situation of the front foot at *e g*. From *e g*, *o o*, and *o o*, draw lines tending to the vanishing points V and V; and square up the points *h h* and *h h* from the plan, until they intersect these vanishing lines at the points *p p*, *p p*; this will determine the extremities of the block at the furthest corners; lines drawn from *o* and *o*, to the two vanishing points, and intersecting lines drawn from *p* and *p*, to the same points, will give the two canted corners of the block at *q* and *q*. It now remains to find the seat of the square Q R S T (in the plan below,) on the top of the block above; to obtain which, draw a line from 2 to the point of distance, which line intersected by a perpendicular squared up from R in the ground plan, will give the front of the square at *r*. A line squared from *r* and intersected by a perpendicular squared up from Q, will give the point *q* above, and determine one side of the square; visuals drawn from *q* and *r* and terminated by the diagonals at *t* and *s*, will give the two returning sides of the same square; which is completed by drawing a parallel from *t* to *s*. Within this square, the circle regulating the base moulding of the pillar

must be drawn, answering to H in the profile. Lastly, square the heights marked 3, 4 and 5 in the profile, to the Geometrical line at 3, 4 and 5. Lines drawn from 3 and 4 to the point of distance, and intersected by perpendiculars squared from *u* and *a* in the plan, will determine the perspective height of the mouldings at *u* and *a*, answering to those marked 3 and 4 in the profile. The diminution of the pillar at 5 is found after the same manner. The sweeps on each side of the block are drawn by hand from *q*, through *p* to *q*; from *p*, through *q* to *o*; and from *p*, through *r* to *o*, on the opposite side. The sweeps making the thickness of the block are drawn after the same manner; the centres of which are found by dropping perpendiculars from *q* and *r*; intersecting *r*, by a line drawn from 1 to the point of distance at *w*, which must be squared across to the perpendicular from *q*, at *x*. The paw feet are likewise to be drawn by hand, which must depend entirely on the taste of the draughftsman; the guiding lines at *p* and *p* pointing out their situation: the same may be said as to the outline of the pillar.

All circular objects, and particularly tables, are best represented perspectively with the eye placed in the centre, or equally betwixt its two extremes; answering to what is termed a central view: this has been adopted in the present example. In all cases where a circular object, as the one before us, comes under practice, the central point of view is recommended in preference to that of a side one; for unless the spectator places himself or takes his station at a very considerable distance on one side of the circle, and also takes a long point of distance, the circle will become very much elongated at the furthest extremity from him; and vice versa, the nearest end will become very much foreshortened: thus, although the block be placed exactly in the centre, the top of the table will appear to hang over more on one side than the other, producing thereby a distorted appearance. These observations have been deemed necessary in order that the learner may avoid adopting that point of view ever found to produce a bad effect.

Plate 14.

The perspective representation of a cheval dressing glass, the front being placed parallel to the picture; shewing the mode and manner of finding perspective by the inclination of the swing frame, thrown back in any inclined position.

Fig. A, shews one half the elevation of the cheval frame and glass, as seen in front. Fig. B, shews the profile of one of the standards, with the inclined position of the swing frame, as marked by the letters X X.

The ground line is denoted by the letters G G; the horizontal line by the letters H H, and in this example is placed 4 feet 9 inches from the ground. The points of sight and distance are both placed out of the picture; the point of sight being 7 feet 2¼ inches by the scale from D on the right hand; the point of distance being the same measure from D on the left hand: this is done for the sake of shewing the object to the best advantage; for in all cases the further the point of view is placed from the nearest side of the object, and the further the point of distance is removed back from the front of it, the greater similarity will its appearance bear to the original. It will be necessary first to make a perspective plan as before directed in the preceding examples: for which purpose, the measure C *a*, in the front elevation, is first set off on the ground line G G from C to *a*, right and left; likewise the measure C *b*, in the same elevation, is set from C to *b*, right and left, on the same line. These measures, *a a* and *b b*, are then conveyed to the point of sight by visuals. The measure *o o*, in the profile B, must next be taken and set off from *a* to *o*; this measure being conveyed to the point of distance, will intersect the visual *a d* at *d*; a line squared from *d*, and intersecting the visuals drawn from *b*, *b*, and *a*, at *e*, *e*, and *d*, will determine by those intersections the utmost stretch of the claws of both standards perspectively; as also their thickness in front. The tinted planes marked *f f f f* and *g g g g*, denote the front and depth of the two blocks which receive the claws, and answer to the measure marked *p p* in the profile: this measure is set right and left of the centre X at the points *p* and *p*, and conveyed by the point of distance on the visual *a d* as before, intersecting it at *g* and *g*.

PERSPECTIVE VIEW.

Front Elevation.

Profile.

The tinted plane marked *k k* shews the situation and perspective width of the glass frame: this is found by taking from the front elevation the measure C *c*, and setting it right and left of the centre C, as at *c c*, from which visuals must be drawn as before, intersecting a line squared from *q*, at *k* and *k*. For the remainder, the student is referred to the example itself, where he will find in the perspective plan, all the lines laid down, necessary for working his draught. So much having already been detailed in the preceding lessons as to raising the elevation from the perspective plan, as also for obtaining the perspective heights of all objects, we have only to state that the heights in this example are all transferred as usual from the profile and front elevation upon the two original lines marked F and G; as denoted by the figures 1, 2, 3, &c. and 1, 2, 3, &c. and carried from thence by visuals to the point of sight, intersecting perpendiculars raised from the corresponding places in the perspective plan, as will be seen by inspection; G being the geometrical line for the standard at the nearest end, and F, that of the standard at the farthest end. It now remains to lay down the process for obtaining, perspectively, the inclined position of the glass frame, its swing being thrown back at any supposed inclination. Let X X, in the profile B, be the supposed inclination of the swing frame: from X and X drop perpendiculars, intersecting the ground line at *x* and *x*. Take half the measure *x x*, and set it right and left of the centre X, as at *x* and *x*; these points convey by the point of distance on the visual *a d* at *m* and *m*; lines squared from *m* and *m*, intersecting the visuals drawn from *c* and *c* will give the seat of the top line *y x*, of the glass frame at *l* and *l*; the seat of the bottom line *y x*, at *n* and *n*. From *c* and *c* on the ground line raise the perpendiculars E and E, upon which lines transfer from the profile, the height of the central point or pivot upon which the glass revolves, at Z and Z; these heights being conveyed to the point of sight, will intersect the perpendiculars raised from *k* and *k*, at *z* and *z*, and determine the height of each centre or pivot perspectively. Next transfer from the profile B, the upper and lower heights, X and X upon the perpendiculars E and E at W and W, Y and Y: these heights convey by the point of sight on the perpendiculars raised from *l* and *l*; *n* and *n*, intersecting them at *y* and *x*, *y* and *x*: lines drawn from *x* through *z* to *x*, and from *y* through *z* to *y*, will represent the inclined position

of the glass frame, which is completed by squaring lines from *x* and *x*, top and bottom. The banding forming the face of the frame, is placed on the perpendicular E, as at V, and conveyed from thence by the point of sight on the inclined line *x x;* the same measure will answer for the three other sides. The divisions comprising the ornamental parts of the stretcher, are taken from the front elevation, and placed on the ground line, right and left of the centre C, at *r r* and *s s;* from thence conveyed on the line *k k*, by visuals drawn to the point of sight, and then carried by perpendiculars upon the line of the stretcher, as may be seen by inspection.

The vanishing point of all inclined planes, supposing such planes to be placed in front of the spectator, as in the present example, is seated in a perpendicular raised upon the horizontal line from the station point; and is found by a line drawn from the point of distance parallel to the inclined position of the glass frame, and continued until it intersects such perpendicular: in this instance the vanishing point for the inclined plane of the glass would be at a considerable distance above the horizontal line, being 30 feet by the scale; and therefore the present process is adopted as saving much trouble and inconvenience to the learner.

The inclined line from D, is drawn parallel to the inclined position of the glass frame X X, and would, if continued, intersect a perpendicular raised on the station point, at a distance of 15 feet above the horizontal line, which would be one half the required distance of the vanishing point; the point D being only half the real distance from the point of sight, as before observed.

Every object moveable on a centre, will by its evolution round its own axis, describe a circle: it follows therefore that the inclined position of all doors and box-lids thrown open; dressing-glass frames, wheel-spokes, &c. may be found perspectively on the circumference of an ellipsis, such being the perspective representation of a circle; but this would be attended with more trouble and time than the process adopted in the present instance.

To elucidate the foregoing observations, two diagrams are added, the one geometrical and the other perspective; shewing the method of finding the position of an inclined surface perspectively, as observed above.

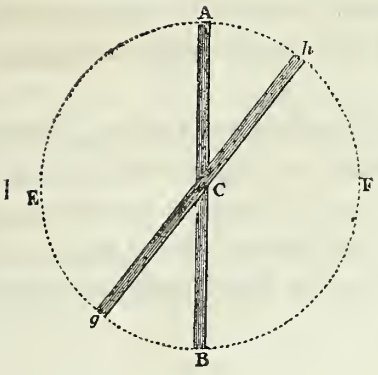


Fig 1

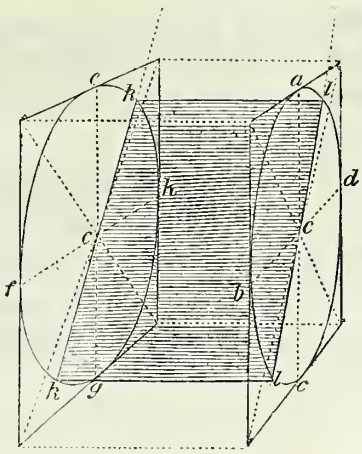


Fig. 2

The learner may suppose A B, Fig. 1, to represent the edge of a glass frame, or any other object, as moveable on its pivot or axis C, round which it revolves. It is therefore evident, that if the frame be turned on its centre, it will by its evolution describe the dotted circle A E B F. If the same frame be removed from its perpendicular position A, to the point *h*, its position will then be inclined, as shewn at *h g;* for being revolved on its centre or pivot C, the bottom edge of the frame would rest at *g*, and make the angle *g* C B, equal the angle A C *h;* therefore let the frame be moved into any position; whether perpendicular, inclined, or horizontal, it would still describe a circle: consequently its top and bottom edges would be limited by the periphery of a circle.

Fig. 2. Shews the circle A E B F, fig. 1, as represented perspectively, the same forming the ellipsis *a b c d:* parallel with it, is shewn another ellipsis *e f g h*, as produced from the same circle. In both these ellipses the lines *k k* and *l l* represent the two upright edges of the glass frame, as placed in the inclined position *h g*, fig. 1. It will be seen in this diagram that the sides of the glass frame converge from the bottom to the top edge, which being continued, would fall into a point situated in a plane perpendicular to the horizon; which perpendicular, as we have before observed, would be raised on the point of sight.

The student has now before him three different modes of effecting the same end, viz. the mode laid down in the Example, plate 14; secondly, the method of finding a vanishing point into which the sides of the glass would

converge, by a line drawn from the point of distance, parallel to the inclined position of the frame, whatever such may be, until it intersects the perpendicular raised from the point of sight; and, lastly, the mode as here shewn in fig. 2.

We shall conclude the present treatise with some Preliminary Observations on Angular Perspective, as applicable to objects of furniture; and explain its principles by an example, shewing a four post bedstead as placed in an inclined position with respect to the plane of the picture; giving at the same time instructions for laying down the lines, vanishing points, &c. for the same.

ANGULAR PERSPECTIVE.

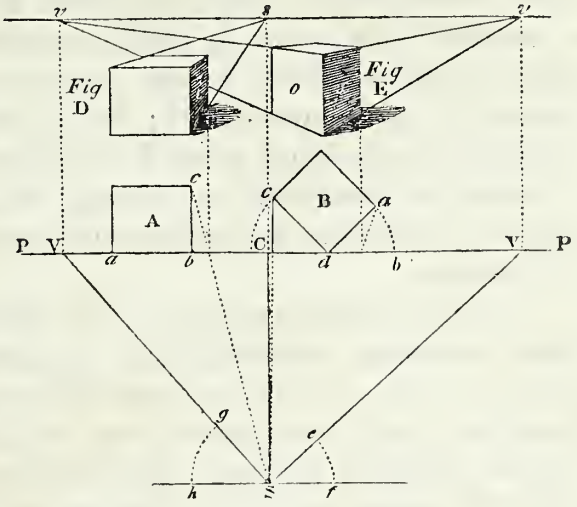
Preliminary Observations.

Hitherto the practical part of Perspective in this treatise has been confined to a parallel view of the object with respect to the plane of the picture; this being considered the most eligible position as regards household furniture in general; first, as conveying a more lively and correct representation of the object to the individual to whom the design is offered; and secondly, by the addition of a plan and profile, accompanied with a scale of feet and inches, enabling the workman to ascertain correctly, every geometrical measure, as regards height, depth, and projection of breaks and mouldings.

There is no method in practice, that can be applied with more success than parallel perspective for the delineation of furniture designs; which therefore in this instance is strongly recommended. Inclined per-

spective, which is more generally practised amongst architects, is chiefly applicable in delineating views of detached buildings with their surrounding scenery; colonnades, porticoes, &c. and all subjects wherein picturesque effect is required; and which parallel perspective would fail to produce. We have nevertheless, in order to render the present treatise complete and generally useful, given one example in this branch of the art; with instructions, showing how far angular perspective may in some cases be successfully applied in delineating objects of household furniture.

The difference between parallel and inclined perspective, consists in the position of the object under view, with respect to the plane of the picture; as is exemplified and illustrated in the annexed diagram.



Let the line P P, represent the plane of the picture; S, the station point, or spot where the spectator is supposed to stand to view the objects A and B. The object A is said to be placed parallel to the picture and to the spectator; as having its front face *a b* parallel to the plane P P, and its side face *b c* at right angles to it; the vanishing point of such side would in this instance be in the centre of the picture, or that point immediately opposite the eye of the spectator; as shewn at C.

The figure B is said to be inclined to the picture; its sides *d a* and *d c* being neither parallel to the plane P P, nor at right angles to it: the vanishing points for the sides *d a* and *d c*, as produced by the lines S V and S V, would cut the picture at angles equal to the angles which the sides *d a* and *d c* would make with the plane P P; as shewn by the arcs *e f* and *g h*; *e f* being equal to *a b*, and *g h* equal to *c* C.

The figures D and E, are perspective representations of the objects A and B, as both would appear to the eye of a spectator stationed at S

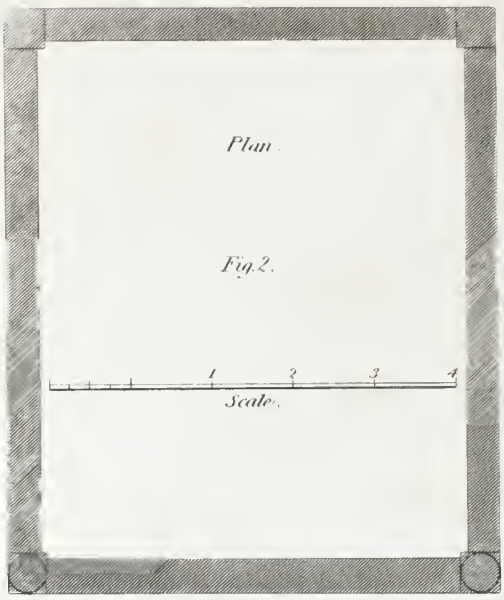
shewing the difference in appearance betwixt a parallel and inclined position of the object: *s* becomes the vanishing point for the return side *i*, of fig D, as squared up from the centre C: *v* and *v* are the vanishing points for the sides *o* and *x*, fig. E, as squared up from the points V and V. When one face of the object, as *a b*, is coincident with the plane of the picture; that is, directly in the line of it, such face would be drawn geometrically, and consequently may be measured by scale.

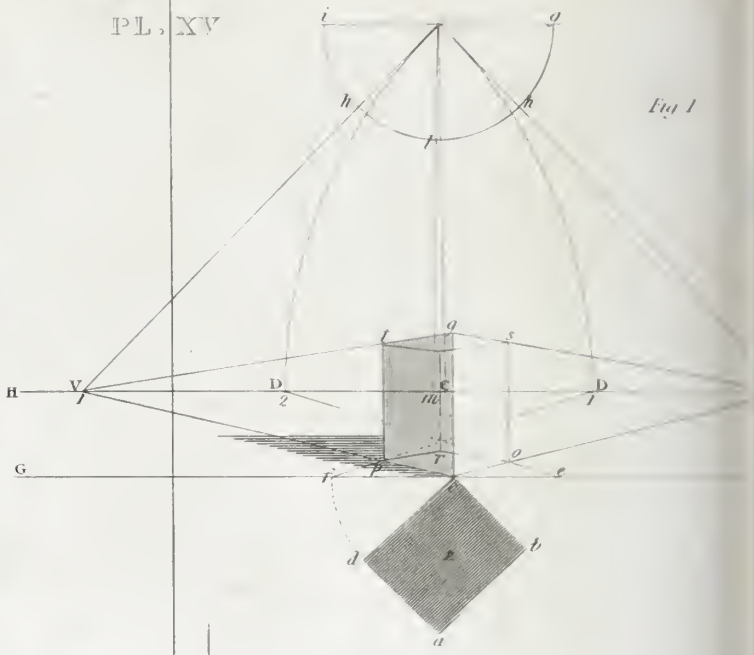
This branch of perspective may be generally applied to all objects, approaching in their dimension and form to that of a square; that is, in any figure wherein one side does not materially exceed the other; as in chairs, bedsteads, pedestals for sideboards, &c.: it may also be successfully applied to all articles of furniture, taking either a triangular, octagonal, or circular form; such as tripod stands, candelabra, loo-tables, &c. When the object is required to be shown in angular perspective, it is always advisable to place the station point at a much greater distance than perhaps would be requisite in parallel perspective; for by placing the station point too near the object, the vanishing points for its sides will be brought proportionally near also, and cause them to converge too suddenly; giving the object a distorted appearance, and consequently conveying an incorrect idea of it to the spectator.

In the example now given, a very distant station is made choice of; which producing vanishing points proportionally distant, tend to give the object a more natural and agreeable appearance to the eye, but which would be found nevertheless very inconvenient in most instances for drawing articles of furniture; such vanishing points being so far removed out of the picture or off the paper, as to require boards of larger dimensions to be made use of, in order to receive them. Having said thus much, we shall now proceed to explain the principles of this branch of perspective, and illustrate the foregoing observations by the following example: (representing a four-post bedstead, as such would appear to the eye when inclined to the picture).

PERSPECTIVE.

PL. XV





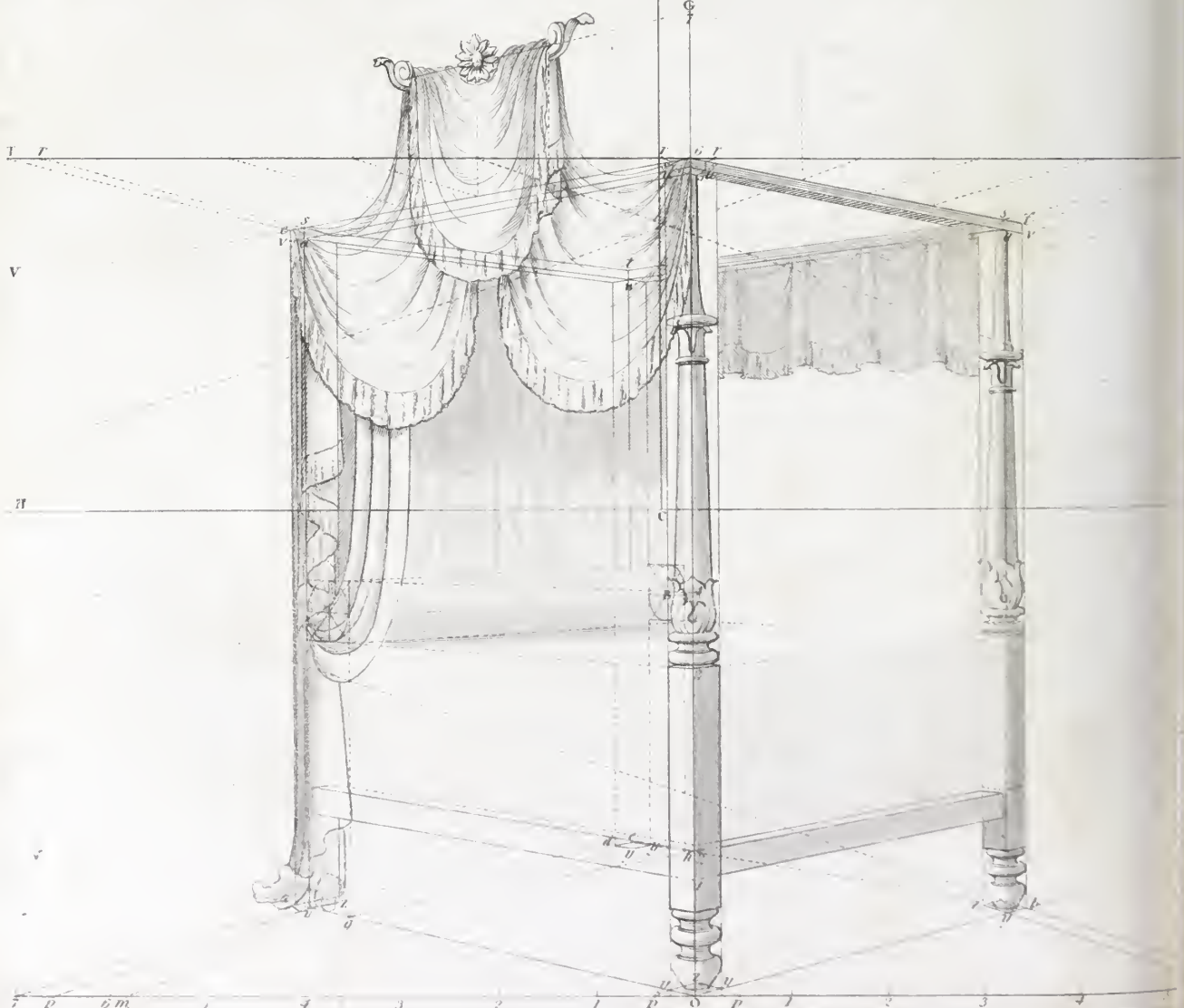


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Plate 15.

To represent a four post bedstead and furniture in inclined perspective, the same being placed in any angular position.

In the delineation of an object in Angular Perspective, it is requisite in the first instance to find the vanishing points in the horizon to which the sides of the object would converge; also to lay down the points of distance, the same serving to cut off all original measures on the vanishing lines, as respects length or breadth; it will therefore be necessary before we commence with our instructions in the present example, to lay before the student the method and process of finding these different points, from any angular position of the object; which being well understood in the first instance, will render this branch of perspective less difficult of attainment. As the vanishing points, and points of distance, made use of in this example of the bedstead, could not be shewn in the plate for want of room, the method for laying them down is shewn in the diagram, fig. 1; where H H, denotes the horizontal line; C S the distance of the picture, as set up perpendicularly from C to S; the same being one sixth of the original distance of the station point for the bedstead, as set up from C on the horizontal line below. Let *a b c d*, be the plan of an original figure, as inclined to the parallel line G G; its inclination being shewn by the angles *e c b* and *f c d*. From the station point S, lay down the angle *g* S *h*, equal to the angle *e c b* in the original figure A; also from S, lay down the angle *i* S *h*, equal to the angle *f c d*, in the same figure. From S, through *h* and *k*, draw the lines S V and S V: V and V, will then become the vanishing points for the sides *a b*, *d c*, and *a d*, *b c*. Bisect the angle *k* S *h* at *l*; a line drawn from S through *l*, will produce the diagonal point at *m*. The distance 1—S, laid down on the horizontal line from V, will produce the right hand point of distance at $\frac{D}{1}$; the distance 2 S, laid down from V, will produce the point of distance $\frac{D}{2}$ on the left hand. The picture is then prepared for practice; having the two vanishing points, $\frac{V}{1}$ and $\frac{V}{2}$ for the sides of the object, with the two points of distance $\frac{D}{1}$ and $\frac{D}{2}$, for the purpose of cutting off on the vanishing lines

c—1 and *c*—2, any original measure of length or breadth. The diagonal point *m*, serves as a vanishing point for any diagonal or mitre line in the plan A, and by means of which, all mitres are projected. Transfer from *c* on the line G G, the side *c b* of the fig. A, at *e*; likewise the side *c d* at *f*, on the same line; these measures conveyed on the vanishing lines *c*—1 and *c*—2 by the points of distance, will give the perspective length and breadth of the figure, at *o* and *p*: lines drawn from *o* and *p* to the points V and V, intersecting each other at *r*, will produce the plane *c o r p*, which plane will be the perspective representation of the plan A. From *c*, *o*, *p* and *r*, raise perpendiculars at pleasure: on the perpendicular raised from *c*, set up the intended height of the object, as at *g*; which draw to the vanishing points as before, intersecting the perpendiculars from *o* and *p*, at *s* and *t*: the figure is then completed. We shall now commence with the application of this diagram in the example of the bedstead. Having laid down the vanishing points, &c. agreeable to the inclined position of the bedstead, proceed and raise a perpendicular O G, from the point O, which consider as a geometrical line. On this line set up all the original heights; viz. the height of the rail at 1 and 2; the height of the foot board and bedding, at 3; the height of the bolster, at 4; the height of the bedpillars and teaster frame, at 5 and 6; and that of the risers on the laths at 7. From O, 5 and 6, draw lines to the respective vanishing points: next take six feet from the scale, which set off from O to 6, on the right hand of the geometrical line; and set off 7 feet from O to 7, on the left hand of the same line: these measures being conveyed on to the vanishing lines O V and O V by the points of distance, will determine the length and width of the bedstead at *a* and *b*. From *a* and *b*, draw lines to the vanishing points, intersecting each other at *c*; and from *a* and *b*, raise up perpendiculars until they meet the vanishing lines 6 V and 6 V at *e* and *f*; *a e* and *b f* will then represent the two extreme corners of the bedstead. The situation of each post on the ground is thus found: take 4½ inches from the scale for the diameter, which set off on the ground line from O to *p*, right and left from 6 to *p*, and from 7 to *p*: these measures convey on the vanishing lines O V and O V by the points of distance, at *y*, *y*, *y*, and *y*. Lines drawn from *y*, *y*, &c. to the vanishing points, intersecting each other at *z*, *z*, &c. will produce the perspective squares *a y z*, *y* O *y z*. *z y b*, and *d z y c*. Thus much

being done, proceed next with the teaster; first by drawing the line T T through the point 6, upon which line, set off the breadth of the teaster lath, viz. 3½ inches, from 6 to *r*, right and left; from T to *r* and from T to *r*: these measures convey on to the vanishing lines 6 *e* and 6 *f*, by the points of distance at *s*, *s*, *s*, and *s*; and square them down on the lines 5 *v* and 5 *v* at *u*, *u*, &c. Lines drawn from *u*, *u*, &c. as also from *e*, *s*; *s*, *s*; and *s*, *f*, to the respective vanishing points, intersecting each other at *t* and *w*, will complete the teaster frame of the bedstead; and perpendiculars squared up from the planes *a y z*, *y o y z*, &c. terminating with the plane of the teaster, will give the representation of each post, considered as a square body. For the side and foot rails of the bedstead, the ornamental parts of the pillars, &c. the learner is referred to the plate. The bolster is found by setting off the measure of its diameter (9 inches) from *p* to *m*, which must be conveyed on the vanishing line at *g*, as before, by the point of distance, and from thence drawn to the right hand vanishing point, intersecting the line *c b* at *h*: lines squared up from *g* and *h*, and cut by the lines drawn from 3 and 4, will give the planes A and B, in which to draw the two ellipsis forming the ends of the bolster; which must be joined by lines drawn to the right hand vanishing point. The bedstead being thus completed, the furniture may be designed and drawn in according to fancy; which in this example is shewn on one side only; the other side, shewing the frame of the bedstead, with the pattern of the bed pillars. The inside vallance is shewn on one side at *f*—*t*.

Fig. 2, shews the plan of the bedstead, drawn to a scale reduced, ¼ the size of the perspective example. The distance of each vanishing point, and point of distance in this example, as set off on the horizontal line from the centre C, is as follows.

	Ft.	In.	
Station point	20	2	upwards from C.
Right hand vanishing point .	19	8	the horizontal line from the centre C.
Left hand Ditto . . .	20	7	
Right hand point of distance .	8	4	
Left hand Ditto . . .	8	7	

In concluding this portion of the drawing book, it may be proper to furnish such hints and observations as will assist the learner, not only in his studies, but at the same time point out to him the course he may persue with

the greatest advantage to himself. My chief aim in compiling this treatise has been, to render the practice of perspective familiar and comprehensive to those for whose use this work is designed; to comprise the result of many years study and practice in as small a compass as the subject would possibly admit of; to illustrate its principles by the most easy and simple examples; and to convey the instructions given with each example in the plainest language. This I have endeavoured to do to the best of my abilities; how far I have succeeded in the undertaking, must be left to the judgment of the reader. The science of Geometry is made the corner stone of my structure: the principles of this science the student is strongly advised to make himself acquainted with; and first with the definitions; not contenting himself with a mere reading, but to use every endeavour and all possible means to imprint them on his memory; so as to have them present at all times, as occasion may call them into use.

Although this may appear dry, and be attended with some difficulty in the first instance, yet once obtained, will render the practical part of Geometry not only more pleasant, but much more easy in the attainment.

Throughout the whole of this treatise, every endeavour on the Author's part has been used to render the science easy of comprehension, and at the same time amusing, as far as the nature of the subject would allow. Much original matter has been given in this treatise, especially in the practical part; and every information afforded which the Author's many years experience and reading have enabled him to offer.

He who would cultivate his vineyard, must labour! He who would reap the fruits of an harvest, must sow! and he who would seek to gain diamonds, must be content to search and dig for them! The same reasoning applies to all those who wish to acquire knowledge; they must not only read, but digest what they peruse, and enure themselves to private study if they wish to learn and excel in any science; unattainable without such resolutions. A slight reading will answer well in the first outset: a closer reading is recommended for the second, and a still closer reading for the third. If the student can be prevailed upon to make use of this exertion, the reward he will ultimately receive, will be more than commensurate to the anxiety, pain, and trouble experienced in the trial. The pupil in this case is recommended to copy each diagram on a larger scale, and if he can be

reconciled to encounter the trouble of writing out the instructions on paper, he will find an advantage more than equal to the time bestowed on the labour; as this will tend to imprint them more firmly on his memory: in addition to which, the written instructions being thus before the student, will render a reference to the work less irksome, and where the references are many, less perplexing.

This practice is recommended by the Author, from the advantages it has afforded to his pupils in their tuition; and inasmuch as it has been observed and followed, so have his scholars improved and benefited by it.

In the study of Perspective, the same course must be pursued as is here recommended with regard to the Geometry; the pupil commencing first with the definitions, which should be well imprinted on his memory; proceeding next with the practical diagrams, which will then be the easier understood; and having made himself thorough master of these, together with their use, he will be enabled the better to apply them in working the practical examples which follow.

He whose disposition would lead him not only to learn, but to excel or attain preeminence in any art or science, must first make himself master of the principles on which that art or science is founded; without which, either his failure in the knowledge of it must follow, or his progress in the study of it be greatly retarded. Perspective as an art, is the offspring of geometry; its principles depending on, and entirely to be drawn from it. To expatiate and enlarge on the utility of these two sciences, with the connection and relation they bear to each other, would occupy and require more room than can be allowed in this place: it only remains to observe, that the doctrine of angles, as laid down in the first part of the geometrical treatise, (see pages 5 and 6) if well digested and understood in the first instance, will be found of essential service in facilitating the knowledge of this most useful department of mechanical drawing perspective. By the doctrine of angles we are enabled to find the true place of any vanishing point to which the side of an object would tend; either in the horizontal, or on a perpendicular plane.

In the Geometrical definitions, the learner will find that frequent reference is made to their use in perspective: (see pages 1, 2, 4, &c.) All lines tending to the point of distance, either in parallel or inclined perspective, answer to the diagonal lines of a square in Geometry: This is quite

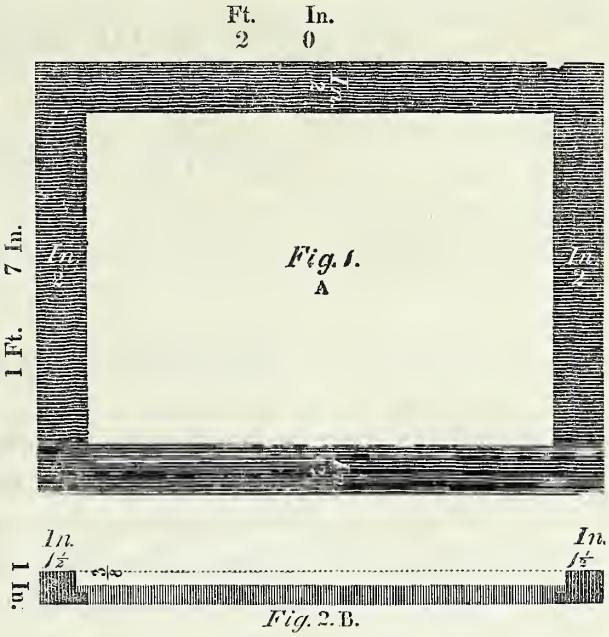
sufficient to shew the accordance and relation, existing between the two sciences.

In framing the perspective examples, as applicable to objects of furniture, attention has been paid to give such only as would be really useful, and at the same time pleasing and interesting; being fully aware, that in most instances, it is necessary to lead the mind, and encourage it in the pursuit of science, by a judicious selection of objects. We shall conclude this treatise with offering to the student the following directions, as regards the utensils necessary for his practice.

In commencing with the study of Geometry or Perspective, it is necessary that the learner provide himself with a case of mathematical instruments, a drawing board, a T square and a parallel ruler. The case of instruments should consist of a pair of dividing compasses; a pair of compasses with shifting limbs, the one for a pencil, the other for ink; a drawing pen with steel point, and a pair of bow compasses for the purpose of striking smaller circles; and these also adapted to receive a shifting limb for pencil or ink, as occasion may require: In addition to these, may be added a plain scale, as described in Geometry, page 55. These instruments are all that are necessary for the student in this department of drawing; the sector, proportional compasses, &c. being more in use amongst those who practice in the higher branches of mathematics.

The drawing board should be made with a shifting pannel, to receive on it the drawing paper, which is first damped over with a wet sponge. It is necessary to be observed, that one side of the drawing paper is to be preferred to the other, as being less defective. In the manufacture of all drawing paper, that side destined by the maker, for receiving the artist's performance, has on it a covering of size, which the other side does not possess; and which therefore may be found defective: this is known by holding the paper before the light, in which case, the water-mark with the maker's name, must invariably read backward; this is the side to be wetted and placed next to the shifting pannel; after which the paper should be notched at the four corners, and, with the pannel, placed in the frame; the whole being secured by two shifting battens: the fair side of the paper will then offer itself, and when dry, be ready for use. The structure of the drawing board for this purpose

will be easie· understood, by reference to the annexed wood-cut, (fig. 1,) which represents it with its front face upwards; shewing a framing all round, equal to two inches. Figure 2, shows a section of the same board; the upper face A, Fig. 1, being denoted at B; by which may be seen, the manner in which the loose pannel is made to fit into the frame. The size of the board for general use, should measure 18 inches by 2 feet, including the outside frame. The T square having a stock, into which is affixed the blade or staff, fitted exactly at right angles to it, should be made of a length proportionable to that of the board in use. In many of these squares, the stock is made to consist of two parts; the one attached to the blade as a fixture, the other moveable on a centre or pivot; and both secured by a thumb screw in such manner, that when the moveable part of the stock is placed at the edge of the drawing board, the other half with the blade attached to it, becomes moveable; and may be adapted to any inclination, or set to any angle at the discretion of the student. (See its use further explained in pages 22 and 23.) The parallel ruler is also of indispensable utility in the practice of geometrical and perspective drawing: its length should not be less than 15 inches for general use. Its construction and use has been already described and demonstrated: (see page 22, Practical Geometry.)



ELEMENTS OF ORNAMENT,

AND

DRAWING IN GENERAL.

Preliminary Observations.

Ornamental drawing constitutes a very essential part in the qualification of those artisans for whose use this work has been composed; viz. that of the Upholsterer and Cabinet-maker: and as no design can be considered complete in which this elegant and useful branch of drawing is wanting, so the present work could not be considered as complete in itself, or as a whole, without a treatise on the subject; combining every information which such a branch of Art would require. It has therefore been thought necessary by the Author to lay down such rules and precepts, as are really necessary and useful for this purpose, offering the result of many years practice and experience.

This part of our work opens a wide field for great and continued gratification; for without ornamental embellishment, the two sister arts (Geometry and Perspective) appear undressed; but with the assistance of ornamental drawing, what is taught in the two former branches, is heightened, realized and brought to perfection by the latter. It is quite possible to delineate a design correctly in perspective; but how often, for want of practice in the ornamental branch, are such designs deficient in good drawing: it is on this ground, that he who would perfect himself and become a correct draughtsman, should make himself proficient in this fascinating, elegant, and useful department of drawing. It remains now to point out the direct road in which the student may travel; not only with advantage to himself, but with a promise of reward at the end of his journey.

It is a usual practice with many parents to send their sons to be taught Perspective Drawing only, whilst they are totally ignorant and unacquainted with that which should precede such instruction: nothing in this instance can be more erroneous in principle, and nothing worse in practice: it would be quite as consistent to put a youth to the learning of Mathematics without a previous instruction in Geometry; and to teach him the science of Algebra, without a previous knowledge of the four fundamental rules in Arithmetic. The Author from many years practice in teaching, has invariably found it of the greatest advantage to the pupil, to perfect him previously in Ornamental Drawing.

The first object of the pupil is to gain a freedom of hand for sketching, and to attain a thorough acquaintance with every line in all its circumvolutions and bearings; and this can only be achieved by continual practice. This mode has all along been considered as the most conducive in the end towards producing perfection of outline in drawing; added to which, a double advantage is obtained; namely, that of designing ornament tastefully, and drawing that ornament more correctly when subject to the laws of perspective. Taking this view of the subject, a treatise on Ornamental Drawing will not be considered as an unnecessary appendage to this work. What we have to detail on the subject will be laid down in a plain and familiar manner, such as will meet the comprehension of the learner.

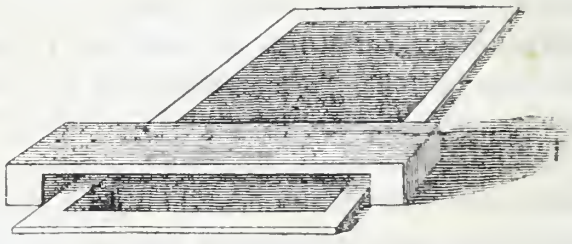
It would be a loss of time to give a youth an ornamental lesson to copy, without first instructing him in the leading principles by which it is produced; for without proper attention be paid in this instance, he will produce a faulty drawing, and in most cases a very imperfect copy of the original.

As Ornamental Drawing therefore forms an essential qualification both to the upholsterer and the cabinet-maker, it should be practised and be well understood previous to the study of Perspective.

Perspective as applicable to furniture drawing, differs in some measure from the practice of it in Architecture; the one being almost wholly confined to straight lines; whereas the other is in a great measure coupled with lines that are curved, or on the sweep. By the rules of perspective, the planes which inscribe all elliptical curve lines are produced; and by the same rules, certain points are found in those planes, through which the outline of such curves may be traced; but without a previous practice in

ornamental drawing, these lines will ever be at variance with truth. To obviate this difficulty, the system of drawing various curved lines is here recommended; and which may be practised jointly with the study of geometry: our system therefore commences with a series of simple and compound outlines, as comprised in plates CX. and CXI. the same having been carefully studied and wholly adapted to ornamental composition; and to which reference will occasionally be made in the subsequent examples. It is here necessary to advise the practitioner to make use of a soft lead pencil, with which the outlines now given should be lightly sketched in.

As a great degree of fluency in this department, depends on the wrist, the Author would recommend the following system. Let a common slate be made use of as a drawing board, on which with a piece of prepared pipe clay inserted in a port crayon (sold at all colour shops), let the pupil practice the examples given; supporting his wrist on a bridge, (constructed as shewn in the wood cut,) so that the point of his crayon will only touch the slate. This may feel somewhat irksome at the first, but the practitioner will soon be reconciled to it; and the advantage obtained by it, will be experienced, when using the pencil or pen without aid of the bridge: the freedom also with which the crayon of pipe clay will pass over the slate, will intuitively and imperceptibly give a freedom to his hand; and of this he can only be convinced by the trial. We shall now commence with the series of examples given in this treatise.



ELEMENTS OF ORNAMENTAL DRAWING.

Outlines

N°1

Plate CX.

The outlines in this plate, as well as in those which follow in plates CXI, XX, CXXI, and XXI, are properly termed elementary; consisting of outlines simple, and compound; in themselves, the foundation of every species of ornamental composition. These outlines, varied in their form, must be practised by the learner, until he finds his hand capable of drawing them fluently and with freedom. This will be greatly facilitated by copying them on an enlarged scale, whether on the slate with the pipe clay crayon as before noticed, or otherwise with a piece of common chalk on a flat board, as the learner may find the most agreeable to himself. The outlines contained in the present plate, have been selected as the most essential for the learner's practice in the ornamental department, but may nevertheless become useful in other branches of drawing.

Fig. 1 and 2, partake of the outline, common to the head and foot scrolls of every Grecian couch.

Fig. 3 and 4, exhibit the same species of outline reversed; and here introduced for the purpose of educating the hand to the practice of drawing the same outline both ways.

Fig. 5 and 6, may also be considered as elementary, being the first sweep lines of all continued scrolls; and therefore drawn right and left also.

Fig. 7, is the first elementary outline in a foliage leaf; being that part where the leaf makes a folding over at its extremity: the learner should also exercise his hand in drawing this outline both ways, viz. right and left.

Fig. 8, exhibits the outline for one half of the tulip flower; and Fig. 9, is the two halves put together. This species of ornament is much used for the ends of cornice poles.

Fig. 10, shows the outline for a scroll which is commonly adapted to the same use.

Fig. 11, exhibits the outline of the Archer's bow; is often used as an ornamental finish in its simple form, but more frequently adorned with foliage.

This outline has been much used for the cornices of windows, as also in those of bedsteads: it has likewise been much used as an ornamental back for side-boards, &c.

Fig. 12, is the outline of Fig. 10, reversed.

Fig. 13, is what is commonly called in architecture the Vitruvian scroll: this ornament is chiefly applicable to the decoration of friezes or borders, and is sometimes used as an ornamental gallery for cabinet work.

Fig. 14, exhibits the outline of a portion of the circle, when drawn perspectively. The external face of all circular objects, such as columns, &c. when seen below the eye, partake of this outline.

Fig. 15, shows the outline of a portion of the perspective circle, when viewed sideways, or removed to the right or left hand of the spectator.

Fig. 16, pourtrays that portion of the perspective circle, as being the most distant from the spectator.

Fig. 17, exhibits the outline of the upper part of the perspective circle, when drawn in a perpendicular position.

Fig 18, is the outline of the perspective circle when complete: the flat surfaces of all circular objects partake of this outline when seen below the eye. These various outlines of the circle are here given, as being considered most essential for the pupil's practice; so that in exercising his hand, he may draw such outlines with more truth and facility, as they occur in the practice of perspective drawing. These five simple forms being well studied and practised by the hand, will save the student much trouble, and enable him to draw many of his sweep lines in perspective, without the aid and necessity of finding the points for the same in a perspective plane, whether above or below the horizon.

Plate CXI.

The outlines in this plate are compounded more or less from those given in the preceding plate: for instance,

Fig. 18, will be seen to partake of the outlines marked 8 and 9 in the preceding plate. It is chiefly used in ornamental work to fill up the vacant space betwixt two scrolls as rising one out of the other: thus, as in the wood cut.

ELEMENTS OF ORNAMENTAL DRAWING.

N°2

Fig. 19:—the same ornament reversed.

Fig. 20: is compounded of the outlines numbered 1, 5, and 6 in plate CX. This combination of leaves is greatly used in the composition of foliage.

Fig. 21, exhibits a portion of what is commonly called in ornamental decoration a foliage leaf; and where five of these are combined together, it is called a palm of the leaf, as bearing a similitude to the palm of the hand, which has five fingers. This species of leaf is tastefully adopted in the decoration of the Corinthian capital.

Fig. 22, is the same outline drawn the reverse way.

Fig. 23, may be considered as denoting the three principal fibres contained in the palm of a leaf: and partakes nearly of the outlines, 1 and 6.

Fig. 24:—This spiral outline is chiefly used as a model for the truss bracket: it admits of being ornamented in various ways.

Fig. 25, is a palm of leaves compounded of Figs. 21 and 22. The projecting part, separating each leaf is termed a pipe, and its upper part (or hollow) is termed its eye. This leaf is greatly used amongst carvers in the composition of foliage.

Fig. 26, is a combination of Fig. 24 and a portion of Fig. 4. This composition or outline when cloathed with foliage, is applicable to the purposes of decoration in various ways; it is sometimes made use of as the outline of a supporting bracket for the upper shelves of a chiffonier.

Fig. 27, is denominated the honeysuckle fan ornament; and is compounded of a portion of Figs. 2 and 4.

Fig. 28, forms the outline of all truss supports, whether for sideboards, commodes, &c.; admitting of great enrichment.

The straight lines drawn through figures 1, 2, 3, and 4, plate CX; as also through Figures 18, 19, &c. CXI, are intended to guide the student in drawing the respective outlines; the inclination of which must be regulated accordingly. In copying these figures, the pupil should commence from the top, as in Fig. 1, and complete the uppermost sweep, in which he will be guided by the space it occupies upon the straight line: he will then proceed to draw the bottom sweep in continuation, from the point where the upper one terminates, until it crosses the straight line at bottom, which must be his guide also in this instance; his eye enabling him to judge of the proportion.

the two curves bear to the staight line, which a little practice will make him master of. What has thus been said of Fig. 1, will also apply to the rest of the outlines on these two plates.

It is here necessary to remark, that as all varied outline owes its birth and perfection to simple outline, so the first cannot be too much considered. By a correct knowledge of outline, we are enabled to give elegance to those forms to which they are intended to be applied; whether as objects of furniture or ornamental decoration. In plate CXI, almost every variation which outline is capable of receiving, is given; at least as much as is necessary to the present purpose.

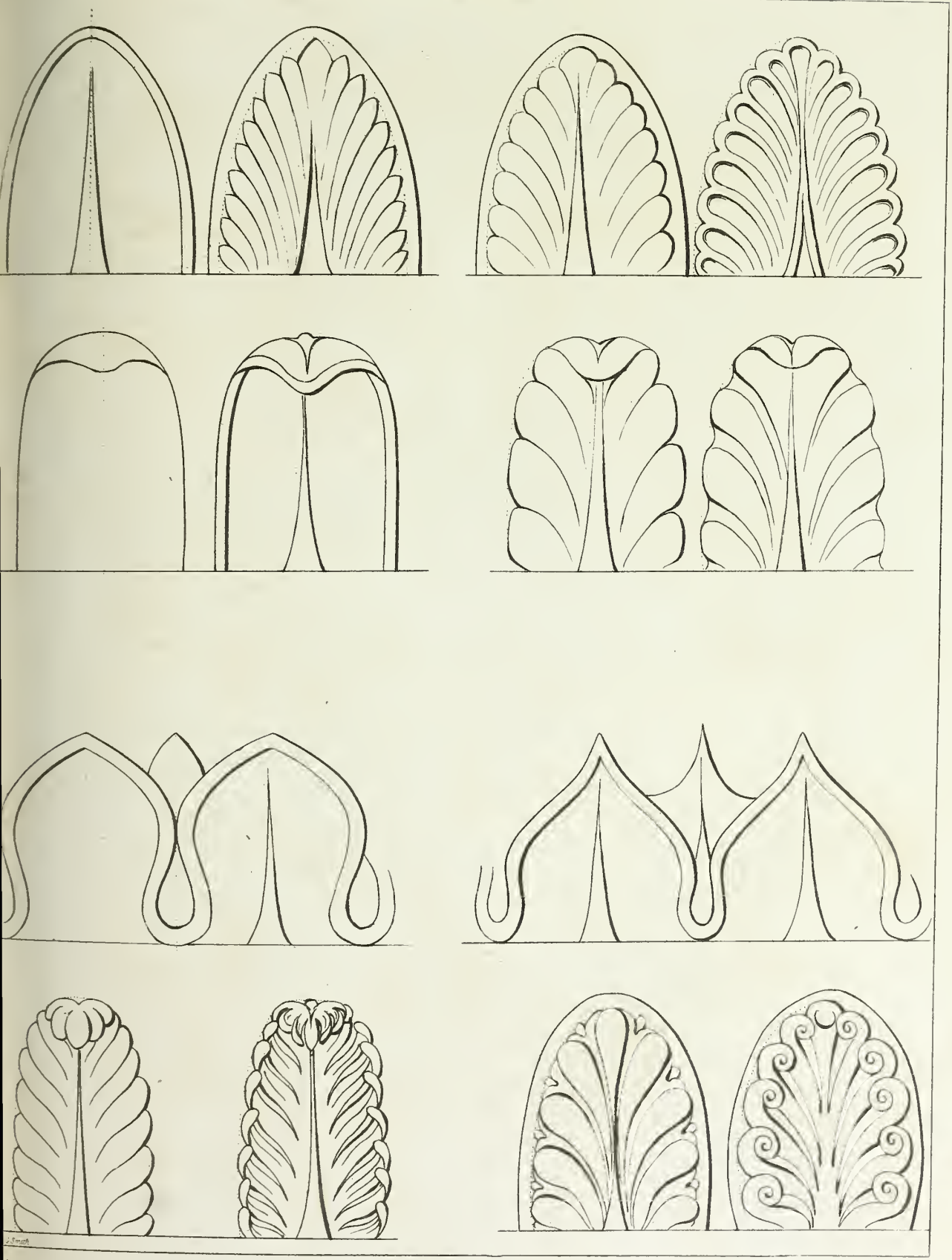
Plate XX.

Consists of a collection of leaves in outline, ranged into four divisions: in the first or uppermost range, the leaf is drawn as a simple outline only, in regard to its width and height. The leaf adjoining, being produced from the preceding outline, is divided into nineteen parts, forming so many smaller divisions of the leaf; and these are pointed at their extremities. The third leaf partakes of the same form, but divided only into thirteen parts, being rounded instead of pointed at their extremities. The fourth leaf in this range is of the same species as the preceding, but divided into seventeen parts, and rounded at each extremity, with the addition of an inner band partaking of the same form.

The second range contains, first, a leaf in simple outline; the adjoining leaf has the same outline, but is varied by an inner line being drawn, which forms a band. The two remaining leaves in this row are of the same contour, or outline as the preceding, having nine divisions within each; the fourth being varied by a hollow separation between each division.

The third row in this plate consists of outlines for such leaves as are principally adapted for the enrichment of mouldings; having the Ovolo, Grecian Echinus, Cima Recta, Cima or Reversa, for their contour or outline.

The fourth and last series in this plate consists, first, of a leaf, having twenty-one divisions for its detail; the leaf adjoining has the same number



lements of Ornament, exemplified in the forms and method of drawing divers kinds of leaves, employed in that branch of Art.

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of parts, but is varied by having a division or space between each part, with the addition of a fold over at the end of every division; forming what is termed amongst carvers, a lipping. The third leaf in this range is the same in contour as the preceding, being divided into nine parts, with a division between each part. The nine principal parts represent the honeysuckle when in bud; the space betwixt each part denotes the flower when in blossom.

The remaining leaf offers the same outline, but is varied in its detail; having eleven divisions, inwardly scrolling at their several terminations. This species of leaf is universally termed, the Greek honeysuckle.

Plate CXXI.

In this plate are given examples of three different species of leaf; consisting, first, of the simple outline of each leaf; and secondly, the same outline filled up with the detail; forming altogether what is termed a foliage leaf. It will readily be seen that these leaves are compounded from similar forms given in plates CX and CXI. These different species of leaf enter more or less into all ornamental composition, and are here purposely introduced, as being essential to the student's practice.

The ornamental specimens given in this plate are variously used in decorating the Corinthian and Composite Capitals in Architecture; and are frequently adopted for decorating the friezes of rooms, &c.: and they often form the principal embellishment of enriched mouldings, pateras, &c. It must be observed that these leaves, and all of a similar kind, are subject to a particular system, as regards the arrangement of their parts; each leaf, consisting of seven divisions; three forming the leafage on each side, right and left, the seventh or uppermost making the turn over.

In the two first examples, each division of the leaf consists of five smaller divisions, and being divided after this manner it is then called a hand or palm of the leaf. The third example in this plate consists also of seven principal divisions, each of which are again subdivided variously; the two lowermost hands consisting of seven parts, the next of nine parts, and the two above these of six parts; four of which only are seen distinct. The turnovers in the three

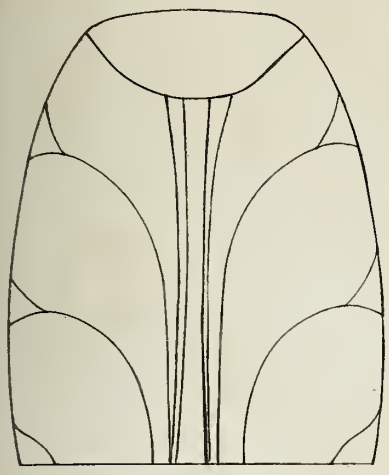
examples are divided, each alike into nine parts. It now remains to furnish the practitioner with some instruction as to the manner in which he must proceed, in copying the examples given in the two foregoing plates, with correctness and ease to himself.

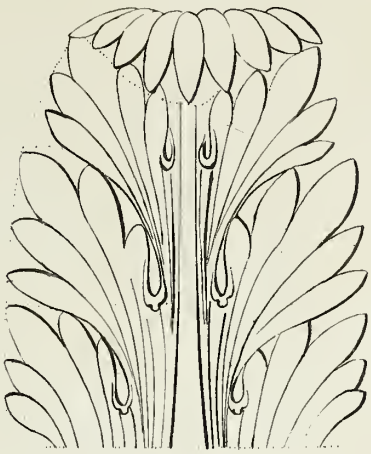
Commencing with the first figure in plate XX, let him proceed and draw a line across his board as a base line; on which line a perpendicular must be raised, and which may answer for the centre or stem of the leaf. Let him next proceed and lay down half the width of the leaf, right and left; after which let the height of the leaf be set up on the perpendicular line, before drawn: the sweeped outline denoting the form of the leaf, may then be carefully drawn by the hand; the eye correcting any irregularity that may occur in the drawing. The outside form being correctly drawn in, will serve as a guide for drawing the inside band. The perpendicular dotted line will then serve as a guide for drawing in the stem. The learner will next proceed to copy the same outline as regards the second figure, observing to draw the inner sweep line but faintly with the pencil; in the leaf before us, it is dotted. Upon this dotted line, right and left, must be noted as many smaller divisions, whether equal or unequal, as it is proposed the whole leaf shall consist of; marking each division by a dot on the faint line: curved lines must then be drawn from these respective points in gradation towards the base and stem of the leaf; and again joined by a reversed sweep from the point of each curve.

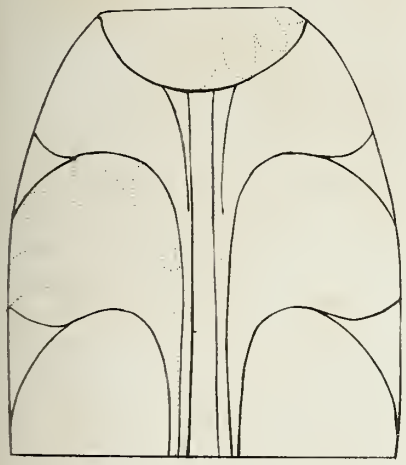
The third leaf exhibits the same outline in its contour, but varied in its divisions. In this species of leaf each division is rounded· and it is thus called a reeded leaf. The instructions given for copying the preceding leaf, will apply to this also.

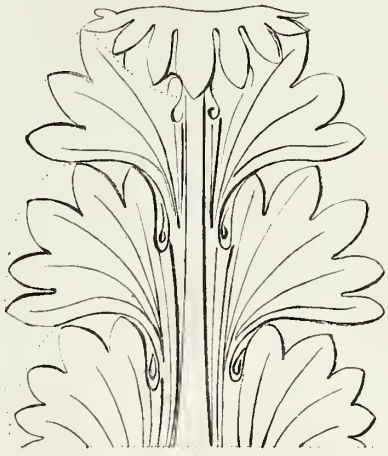
The fourth leaf in this series, takes a similar outline, and is divided nearly after the same manner; the variation consists in the terminations being more rounded, with the addition of a hollow or flute within each division: it is drawn after the same manner as those preceding it.

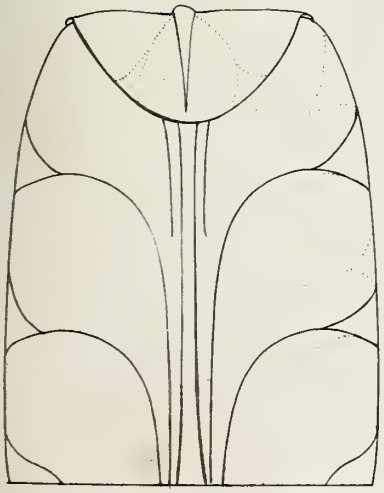
In the second range of leaves, the second example is produced from the first; the third is produced from the second, and the fourth from the third. These leaves are all subject to one and the same outline as to their outside form; being varied in their detail at the pleasure of the artist.

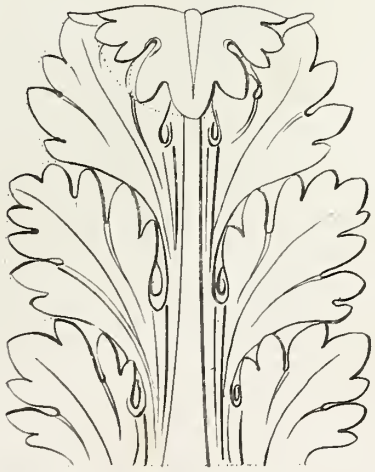












ORNAMENTAL DRAWING LEAVES, II.

The third range in this plate shows the manner of drawing the outline for the strap leaf. The dotted lines point out how the leaf is divided, when a repetition is required: these divisions form the centre and extremity of each leaf, and are repeated on the base line for as many leaves as are required.

In the fourth range, the two first leaves are both under one outline, the second being a slight deviation from the first; the same is to be observed of the two last. What has been said before, as to the drawing of them, renders any further directions unnecessary. The student by repeated practice in copying, will soon find himself in a capacity to overcome every difficulty, as to producing a correct imitation of any example which may be placed before him. It may however be necessary to advise the practitioner to commence filling in the detail of each example from the lowermost point, and to proceed upwards; carefully copying one side of the leaf first. The different heights may then be transferred to the opposite side by the aid of a T square, admitting that the paper be laid down on a drawing board. Whatever can be achieved by the eye without having resource to the aid of compasses and square, is rather to be recommended, as accustoming the pupil to copy more readily from the original: nevertheless the usage of these helps is not altogether to be denied; particularly when more than ordinary accuracy is required. It may also be necessary to remark, that a soft lead pencil should always be used, and that with great lightness when sketching in the rough outline, so that any mistake may the more easily be rubbed out, and a cleaner and better surface be retained on the paper. If we have been somewhat particular in this first part of our treatise, it is with a view of rendering directions less necessary in what is to follow.

In Fig. 1, Plate CXXI, which represents in simple outline, fig. 2; the base line should first be drawn; afterwards the centre or perpendicular line: the base line will receive all the widths, the perpendicular the heights. The outside sweep line, with the turn over of the leaf must then be drawn: afterwards, the distance of each pipe from the centre line in Fig. 2, must be set off right and left from the centre in fig. 1; as also the termination *o a* of the first palm at bottom, together with the width of the stem.

Next proceed and set up the height of the first palm of leaves on the perpendicular line; then the second, and lastly the third. The height and width of each palm or hand of leaves being thus denoted, the outline com-

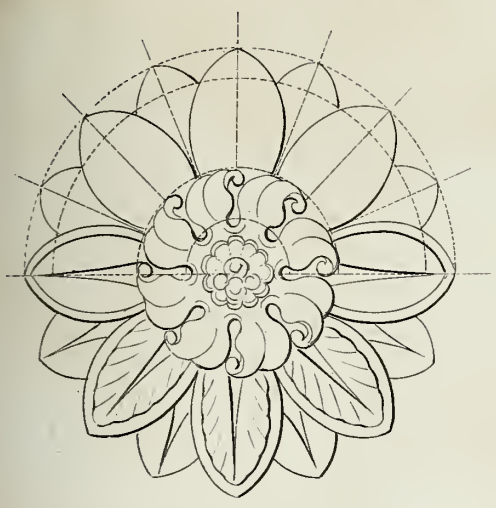
prising them may be drawn after the manner shown in the example: this completes the orthographic elevation of the leaf in simple outline. The mode of procedure now laid down, should be pursued by the practitioner in copying from any original object which may be placed before him; inscribing such object, first in simple outline; dividing such outline afterwards into parts or sections, and such sections to contain the detail of the smaller parts.

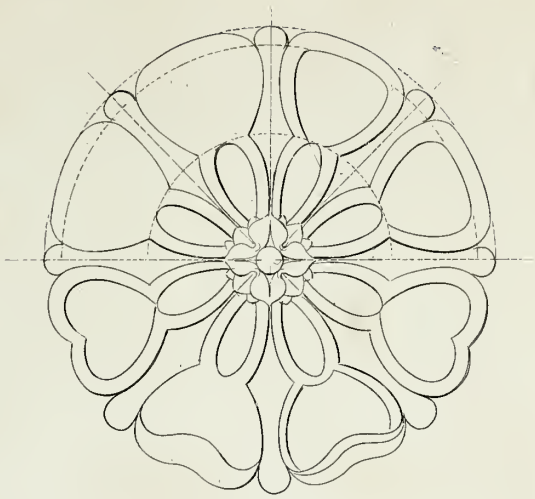
Plate XXI.

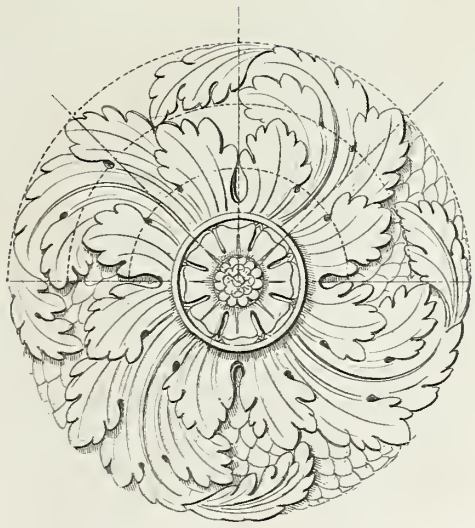
In this plate are given five different examples, intended as designs for Pateras; shewing the manner of dividing them into simple outline, and the mode by which they may be varied.

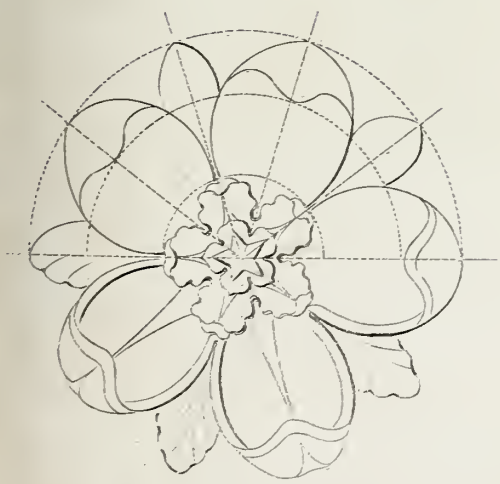
The pupil in reference to the first figure, must commence and draw a line across his board or paper, which may be considered as the central line of the Patera. Upon any part of this line as a centre, he will then with his compasses describe the circular outline which is to form the utmost boundary of his figure, as shown by a dotted semicircle in the example. This semicircular line may then be divided into eight equal parts: lines drawn from these points to the apex, will determine the centre or stem of each leaf. Another semicircle must then be described within the first, which will regulate the extent of the intermediate leaves, generally called the tongue leaf. Within this is inscribed a third circular line, comprising the outline of what is termed the rose of the Patera; and within this again is described a fourth circle, regulating the turning, or eye of each leaf in this portion of the figure A smaller circle is then described, comprising that part of the ornament called the eye of the Patera. It will be seen that one half the range of leaves in this Patera are drawn quite plain, forming a mere outline. The variation of the above outline is exhibited in the lower half, each exterior leaf having a band or list around it, with the central line formed into a stem. For drawing in the foliage, the pupil must be guided by his eye and hand.

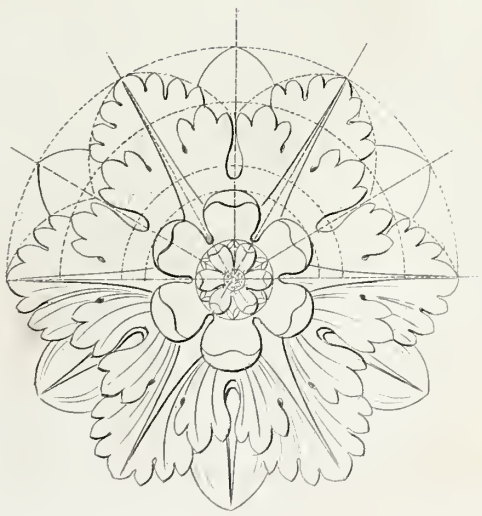
With respect to the second figure, it is subject to the same law as regards the drawing of the first; its extreme outline being first defined, and then that of the smaller circles within it; but instead of eight parts, this











Shewing the application of various kinds of leaves in forming Roses, Pateras, &c. &c.

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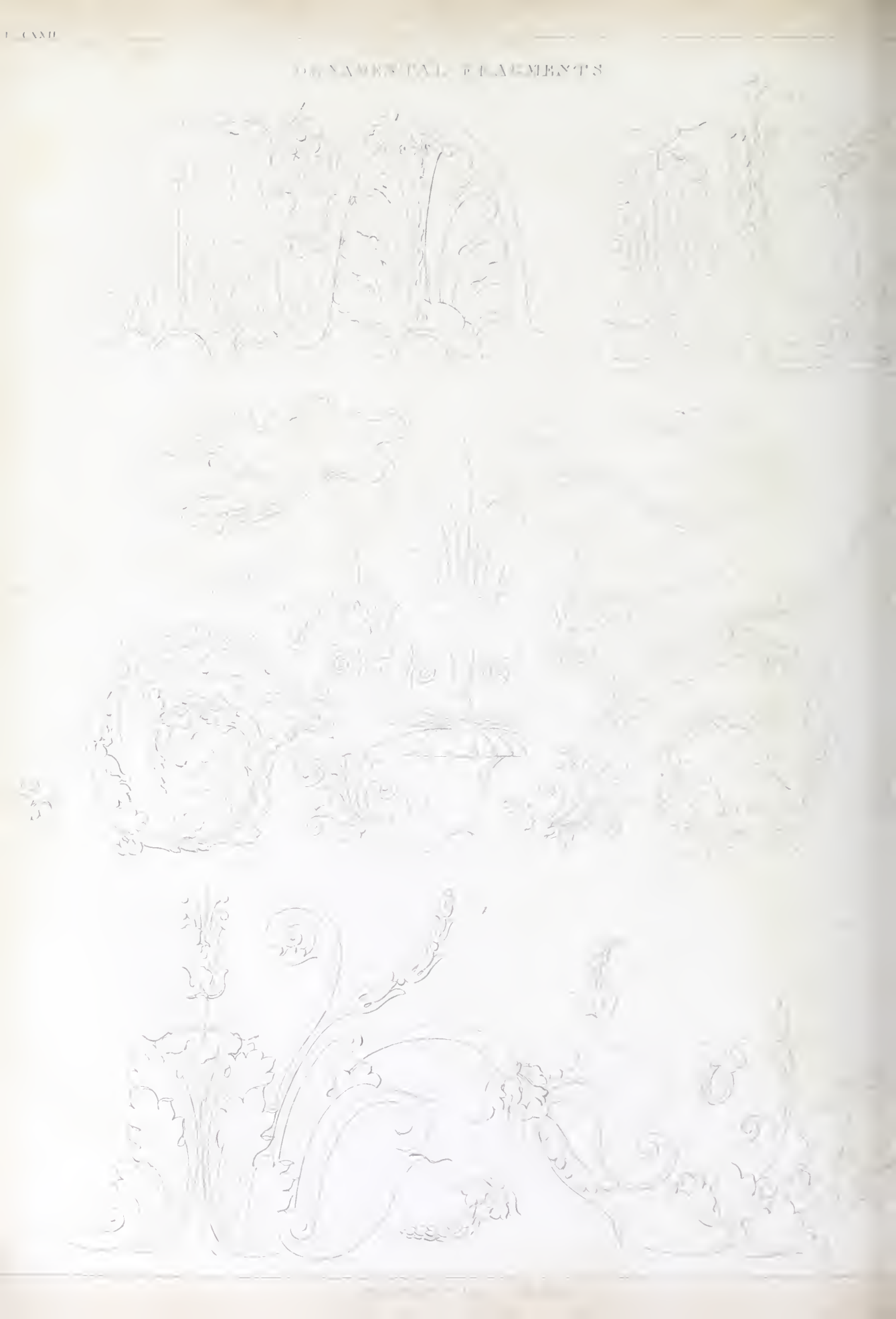
ORNAMENTAL FRAGMENTS



Patera has its half or semicircle divided into four only. Having been fully explicit and particular in describing the first figure, it becomes unnecessary to go over the same ground again; we shall therefore leave the student to his own exertions, with the copy to guide him in the progress of his work.

The third or centre Patera, in this series, from its pattern, is termed spirally involved; inasmuch as the stems of the leaves composing its foliage, have a tendency, one to follow the curve of the other, from the centre or apex. The whole circumference of this Patera is divided into eight parts, four of which regulate the eyes dividing each leaf, and the remaining four their stems.

This species of Patera is frequently termed a bosse, and is greatly used in our cathedrals, as forming a finish for supporting the extremities of several arches when joined together; or rather the crowning to a centre in which they would terminate. They are as varied as they are richly decorated. In this example four circles only are necessary, for limiting the outline of the foliage and its component parts. The outermost circle serves for the outline of the patera and the extreme limits of each leaf; the second, for the eyes and the turn overs of the leafage; the third, for the eyes in the lower range of palms, and the fourth for the rosette or centre. After what has been before said, the student is supposed to be capable of following the example placed before him, making use of his own judgment, taste, and perseverance in drawing the details.—The two remaining Pateras are alike subject to the same rule for drawing them; the principal lines defining their parts, being laid down in the examples, will afford sufficient assistance to the pupil in copying them with correctness.

Plate CXXII.

In this plate are given four different designs for Ornamental Composition, combining every description of sweep and variation of outline that can be introduced into ornamental decoration. The two first examples are compositions, displaying the manner in which leaves are capable of being decorated, and that in various ways. The third example exhibits an assemblage of ornament adapted as a centre; from whence a continuation is

supposed to be made, both from the right and the left hand. The fourth example is a composition from various ornamental fragments discovered at Pompeii; intended likewise as the central part of a frieze ornament.

All these examples are here given solely for the purpose of practice in copying, and should be drawn on an enlarged scale; observing the same rules as to dividing them into parts for their simple outline, as is detailed in the preceding plates.

With these examples we shall conclude all we have to offer on the score of outline in Ornamental Drawing, convinced that enough has already been given for the practice of the learner; at least as much as is sufficient for the present purpose. If the student can so far perfect himself in drawing, as to copy correctly all the examples here given in this treatise, there is every promise of his succeeding, when those of a more difficult nature are placed before him.

SHADOWING.

Previous to entering upon the practical part of this section of the work. it will become necessary to say something as to those laws which regulate the various gradations of light and shade.

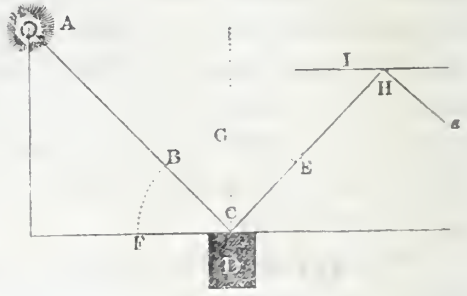
Without perplexing the mind of the reader with the theory, or the various opinions of writers on this subject, it will be quite sufficient to our present purpose, simply to consider light as being subject to, and capable of being reflected from other bodies, or refracted by the interposition of other mediums; the materiality or immateriality of its nature appertaining more to the inquiring mind of the Philosopher, than to the tasteful genius of the Artist. To explain the progress of light, and the effect of it as producing shade from solid bodies, is all that is needful or can be any way useful in this work.

The rays of *light* as proceeding from the Sun, the great luminary of our system, are universally in their passage through space projected in straight lines; but these straight lines in their passage are subject to interruption, and are broken or divided from their regular course, by the rarity and density of the different mediums, or atmospheres through which they have to pass: this in mathematics is what is termed refraction of light; the theory and demonstration of which belongs exclusively to optics.

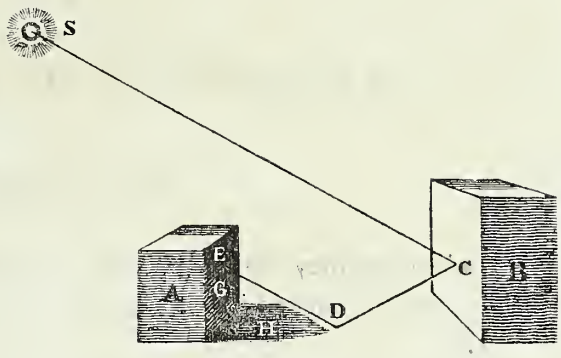
It may however be necessary to state, that this refraction of rays produces what is commonly termed daylight; that is, the light we experience when the Sun is concealed from our view by the density of the atmosphere. In this case the shadows from solid objects, are mellowed and much penumbrated; being scarce definable at their extremities, and in opposition to those as cast from objects opposed to the direct rays of the luminary; the shadows of which are determined and opaque. We shall here consider the rays of light as proceeding direct from the luminary, uninterrupted by any intermediate medium; and thus falling with their full brilliancy on such objects as are intended for shade, or from which shadows are to be cast.

It must likewise be observed, that as the diameter of the Sun's body greatly exceeds that of the earth, and his distance from us being so immense; the shadows of all solid bodies will be found to flow in a parallel direction: this may be seen by any observer under a clear sunshine, when the shadows, as cast from the iron railings before a dwelling house, will be projected from each bar, the one perfectly parallel to the other.

The rays of light falling on solid objects, such as are opaque, or whose surfaces are not penetrable by light; such rays are diverted from their direct course, and fly off in other directions; in which case they are termed reflected rays; and this reflection of rays, as they illuminate objects already in shadow, come more especially under our notice.



This will be understood more fully by reference to the annexed diagram, where we may suppose A to represent the luminary; B, a ray of light issuing from it; C, the point on the solid body, (D) where this ray would fall; which ray would in this case be interrupted in its progress and fly off in the direction, E. Now we say, the angle of reflection (E C G,) is equal to the angle of incidence (B C F); that is, the angle made by the falling ray B, with a perpendicular dropt from the luminary at A, will equal the angle the reflected ray would make with a perpendicular raised from the point C: this serves to explain the reason why objects in shadow are illuminated by means of light reflected from other bodies opposed to them. Suppose I to represent the ceiling of a room: B, the direction of the light issuing through a window; impinging on the floor at C, and from thence reflected in the direction E: It is evident that this reflected ray, or collection of rays, would illuminate the ceiling at H; it would again be reflected from H at an equal angle (as shewn by the line H *a*) until interrupted again by the floor or some other adjacent object; and this reflection would be carried on incessantly, until darkness succeeded to light. From this cause is to be attributed, the floating light existing in all apartments; and from being well conceived and understood, has been sometimes ably and beautifully managed by painters both in oil and water



colors. From the same cause, that side of a solid object, the most in shade, would be illuminated and rendered less dense, by the light reflected from the illuminated side of some other object opposed to it. The annexed diagram will serve to explain what we have now said. Suppose S to represent the luminary; A, a solid body, having its side G, in shade, from whence the shadow H, on the ground is projected. Suppose B to represent another solid body, having its front or illuminated side opposed to the shadowed side G, of the solid A; now the ray of light from S would impinge, or strike on the block B at the point C, from thence be reflected downward by an equal angle to the ground at D, and again be reflected from D by an equal angle, until it impinges or strikes upon the side (G) at E; which portion of the face would instantly become illuminated, losing part of its shade, and leave the shadow cast from it on the ground, the darkest. The shadow on the ground in its turn, would be again illuminated at its extremities by means of the reflected light from C; leaving that part of the shadow which is nearest the solid, the darkest. We have thus been minute and particular in explaining this interesting branch of painting, being a subject little treated of, in works of this kind; the theory of which may be found in the 13th, 14th, and 15th Propositions of the 1st book of Euclid. The Author would recommend those who wish for further information on this head, to a Work recently published, entitled "Sciography, or Examples for Shadows, with Rules for their Projection, by Joseph Gwilt;" and also to the Works of Sir Joshua Reynolds, Fuseli, and others.

PROJECTION OF SHADOWS.

Plate CXXIII.

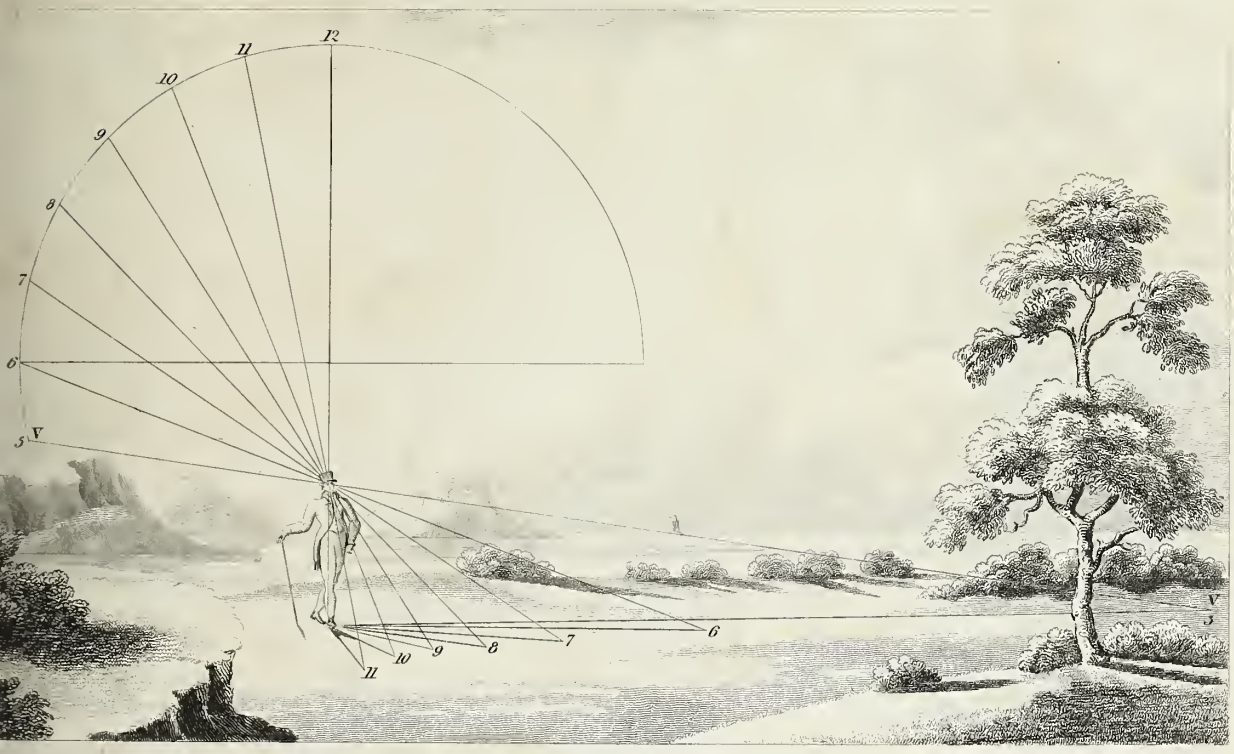
Shadows, as they are projected by the Sun, vary in their length according as the luminary changes its situation in the heavens at the different hours of the day.

Those Shadows which are projected the soonest after sun rising, or just before the time of his setting, will become the most lengthened; and be gradually foreshortened, each in proportion as the Sun appears to approach or recede from the meridian; or in proportion as the surface of our planet would be opposed to him in her diurnal revolution round her own axis. Shadows as projected from the Sun, will vary also in their length according to the particular month of the year in which the earth's surface may be opposed to the luminary in her annual revolution. For the Sun as seen from our earth will appear to rise and set in different points of the horizon at different periods of the year; hence it is that his height at noon, is so much higher in summer than in winter This also accounts for the difference we find in the length of the day at the different periods of the year. The first Example in Plate CXXIII. will serve to elucidate what we have to say by way of explanation on this subject. In the example now before us, we have here supposed the time of the Sun's rising to take place at a little before five o'clock in the morning; that is, at the time when his light would become perceptible to us above the eastern point of the horizon.

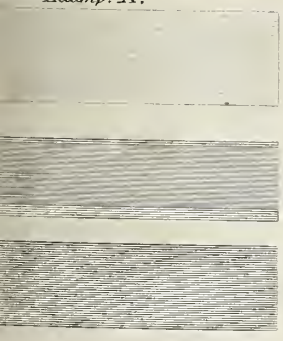
The figure of a man is here represented as placed under the centre of a semicircle, or immediately under the angle of a quadrant; which is elevated above him at pleasure, and is divided into six equal parts, answering to so many hours of the natural day. Now supposing this half, or quarter circle to denote the Sun's daily path in the heavens, the figure as opposed to it will then appear to receive the effect of light from the luminary, casting his own shadow on the ground; which, supposing the figure to be stationary

SHADOWS.

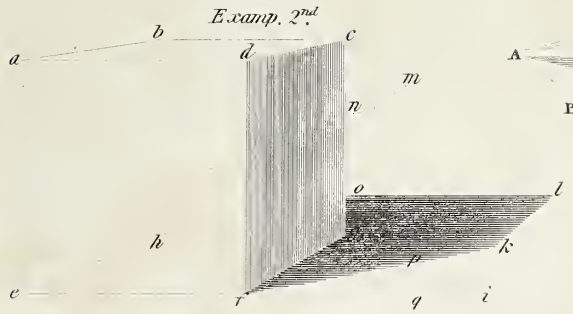
Examp. 1.st



Examp. A.



Examp. 2.nd



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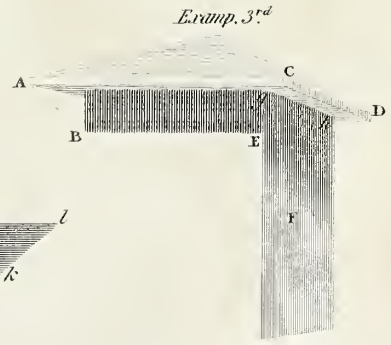

Examp. 4.th

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will vary in length as the sun appears to travel onward towards its meridian at the point 12 in the semicircle. At five o'clock in the morning the sun will have arrived at the point V; in this case, a line drawn from 5, being prolonged and passed over the head of the figure, will extend to the point V on the ground: the line A V will then denote the length of the shadow, as cast from the figure at that period of the day. A line drawn from the point 6 on the quadrant, and continued over the head of the figure, until it intersects with a line drawn from his foot, at the point 6, will give the length (A 6) of the figure's shadow at six o'clock in the morning; and so on for all the rest, until the sun attains its meridian or greatest height at twelve o'clock, when it would be situated directly over his head, and in that case cast no shadow. The quadrant on the other side, if divided after the same manner, will enable us to obtain the length of the shadows, as they would be projected by the sun in the opposite direction, at the corresponding hours after mid-day. It will be necessary to observe that the lines from the foot of the figure, as denoting the length of his shadow at the different hours of the day, and numbered 1, 2, &c. are here drawn in different directions, for the purpose of shewing the length of each shadow distinct; which if represented by perfect horizontal lines, would be confounded and run one into the other, and present one uniform line in length.

It now remains to lay down such rules as are necessary for the casting of shadows, previous to which it may be useful to say something as to the material to be made use of in tinting, generally termed China or Indian ink, which is of various qualities. The best is that which is found to rub smoothly without grittiness, and is strongly scented with musk, the same giving a brown and mellow colour to the ink. The pupil must here observe that a tint produced from Indian ink alone, will always appear lighter when dry than when wet, and therefore deceive the student as to the effect he wishes to produce in his drawing; in this case it will require to be often repeated, until the proper depth of tint is obtained. This inconvenience may in some measure be obviated by making use of a mixture of sepia, (an article to be procured at any of the colour shops) which partakes of a rich brown tint, and will give a decided tone, retaining the same force when dry as when wet; this will tend to remove the defect experienced in the use of Indian ink alone, and give at the same time a soft and mellow effect to the drawing.

The brushes necessary for use are of two kinds, the one commonly termed the camel's hair pencil, the hairs of which are of a soft nature, and generally of a black colour; the other is termed the sable pencil, as being manufactured from the hair of the sable, the hairs being of a firmer texture, and generally of a red colour. The camel's hair pencil is sold from one penny and upwards, according to the size and quality; the sable hair pencil sells from eight pence and upwards: of the two, the sable is to be preferred, being of a more durable nature than that of the camel's hair. In choosing the one or the other, the brush should be first dipped into water, then drawn through the mouth without much pressure, no more than will just conduce to bring the hairs all to one point; if when thus drawn to a point, the brush be applied to paper and gently moved backward and forward, the hairs not dividing but adhering closely to each other, the brush may then be considered as one of a good quality. Hair pencils are manufactured of various sizes, beginning with one small enough for the finest enamel painting, and finishing with a size sufficient for the largest pictures. As far as concerns our present purpose, brushes, such as are confined within the duck or goose quill, will be found to be quite as large as will ever be required; especially for single objects of furniture. In shadowing the interior of rooms, wherein a large body of tint is required, a brush confined within a swan quill may be of use.

The rubstone is an article also necessary in drawing, as used for the mixing of Indian ink tint; it has three hollow receptacles for tint, besides a shelving groove, in which the ink is generally rubbed. The three hollow receptacles serve for mixing up three different degrees of tint from the same colour, before the process of tinting is commenced upon. To elucidate what we now recommend, the student is referred to the Example marked A, in Plate CXXIII.

No. 1, Exhibits a tint composed of Indian ink and a small portion of sepia, which being mixed very light, is termed a first tint.

No. 2, Exhibits the first tint as strengthened or made deeper, by the addition of a little more ink and sepia; it is then denominated the second tint.

No. 3, Exhibits the second tint as strengthened still further by a larger addition of the two colours before mentioned, and is then termed the third

gradation of tint. These three gradations of tint are almost all that are necessary for general effect of shade: but where a strong and decided effect is required, a fourth tint may be used by deepening No. 3, with a stronger proportion of Indian ink and sepia; this we shall have occasion to notice in the fourth Example. Having thus given ample instruction as to the mixing of tint in all its variety of tones, we now proceed to practice; referring our student to the second Example, which represents a cubical block *a b c d e f g*. In this Example the luminary is supposed to be inclined to the front face *(a d e f)* of the figure; in which case the shadow cast from it on the ground, would fly off at some angle, more or less as the sun is inclined in regard to the object which it illuminates; this inclination or seat of the luminary is denoted by the angle *k f i*, as measured by the arc *p q*. The next point to be attended to, is the sun's declination; or rather its precise situation in the heavens in its daily course from east to west, as explained in the first Example; which in the present example is denoted by the angle *c g l*, measured by the arc *m n*.

The student must first determine the sun's inclination as *f k*, which being done, lines may be drawn parallel to this from *g* and *h*, at pleasure. The sun's declination being next determined by the angle *m c n*, lines parallel to such must be drawn from the points *d* and *c*, where the rays of the luminary would strike the object; their intersection with the inclined lines *f k* and *g l*, at the points *k* and *l*, will determine the utmost projection of the shadow at *k l*. A line drawn from *l* parallel to *e f*, until it cuts the inclined line from *h*, at *o*, will give the shadow of the side opposite to *a d e f*. All the inclined lines, denoting the sun's inclination and declination, may be drawn as to their parallelism by means of the T square with its moveable haunch or shoulder. The outline of the shadow being denoted by faint pencil lines, the pupil will commence his tinting by washing over the whole figure and cast shadow with the tint No. 1, Example A. Next, with the tint No. 2, he will proceed and wash over the return side *d c f g*, and also the cast shadow; leaving the front face *a d e f* and the upper surface *a b c d* in the first tint. Thirdly, with the tint No. 3, he must observe to wash over the cast shadow only. He may next with the same tint wash over a portion of the shadowed side of his object, commencing upwards from *d c*, and soften it into the original tint by passing his brush slightly into pure water, and then as quickly

as possible, proceed and draw the tint downwards. He must again dilute his tint in water and draw the last degree of shade downwards, until it gradually mellows into the tint originally laid on: this is what is called in painting, softening off, or rather penumbration of shadow; that is, allowing some reflection of light, either directly or indirectly, to fall on your object in shade, by which the uniformity and flatness is counteracted. It will be sufficient to say that the shadow on the ground is to be managed after the same manner, observing to keep the darkest part of the shadow close to the bottom edge of the object; by which means a brilliancy and force will be given to the object which it would not attain without.

Example 3. This object has a capping or projection A C D; the same casting a shadow B E on the cubical block underneath it. The depth of this shadow is regulated by the sun's elevation, and would be deeper more or less, according to the time of day in which it is projected. The sun's elevation (or declination) is denoted by the dotted line A B, and determines the depth of the shadow as projected from the capping A C, at B; which must then be squared across to E. The whole of the figure may then be washed over with the first tint No. 1, as before directed; after which with No. 2, pass over the cast shadow B E, with the soffit or under part of the projecting cap A C D; and also the return side F. Then proceed with the third tint, and pass over the cast shadow B E with the soffit of the projection A C, leaving that of the projection C D. Again with the same tint, pass it under the projection on the solid at *g h*, and soften off as shewn in the Example. Lastly, with the third tint, made a small degree darker, pass over the shadow B E, and again over the return side at *g h*: the figure will then have attained its proper effect. These two Examples although slight in themselves, will be sufficient to give the student an insight into the manner in which shadowing is managed and effected; and enable him to comprehend more clearly what will be offered to him in the next plate. A complete and comprehensive dissertation on the laws of shadow might have been here given, with the whole process laid down for projecting them; but as this is a matter of more concern to the architect, we have only retained and explained so much as could be of real use to those, interested in perusing or studying the present work.

Example 4. Exhibits four truncated columns, and shews the process

of shadowing all objects that are round or cylindrical. In this Example are displayed the different gradations of tint, necessary for giving to a cylindrical body the full effect of rotundity. All turned legs of tables, supporting pillars, bedposts, pedestals, &c. as partaking more or less of a cylindrical form, will require to be shadowed after the manner here laid down.

Having prepared a tint equal to the tone of No. 1, (Example A,) commence with the column No 1, and with this tint in your brush pass it down the shaft, in width equal to *x x*; turning it suddenly off at *a* until it reaches the base at *b*: the tint so passed down must then be immediately softened off at both edges, right and left. The same tint must then be passed over the base moulding and the return side of the plinth, as likewise over the shadow cast on the ground. You will next proceed and strengthen your tint to the tone of No. 2, and with a sufficient quantity in your brush, pass it down the shaft of the column over the preceding tint, as before, and likewise over the base moulding; only not so broad as *x x*: this must again be softened off at both edges; observing not to cover the tint first laid on entirely, but to leave a portion remaining: your column will then be brought to the effect of No 2. You will then with a tint equal to No. 3, pass over the shaft and base of the column direct from the right hand edge, keeping it to the breadth of *c d*; which must be softened off towards the left hand, leaving a portion of the second tint uncovered: your column will then be brought up to the effect of No. 3.

This will be found sufficient for most subjects of a cylindrical form; but where a greater strength of effect is required, the tint No. 3, a little strengthened, may again be passed down from the right hand edge of the shaft to the breadth of *c f*, and softened off as before; which will bring it to the effect of No. 4. The student will remark, that a weak tint is passed down from the left hand edge of the column, and softened off; leaving a small portion of light on that part of the column where the sun's rays are supposed to strike direct: by this means a greater effect of rotundity will be produced.

Plate CXXIV.

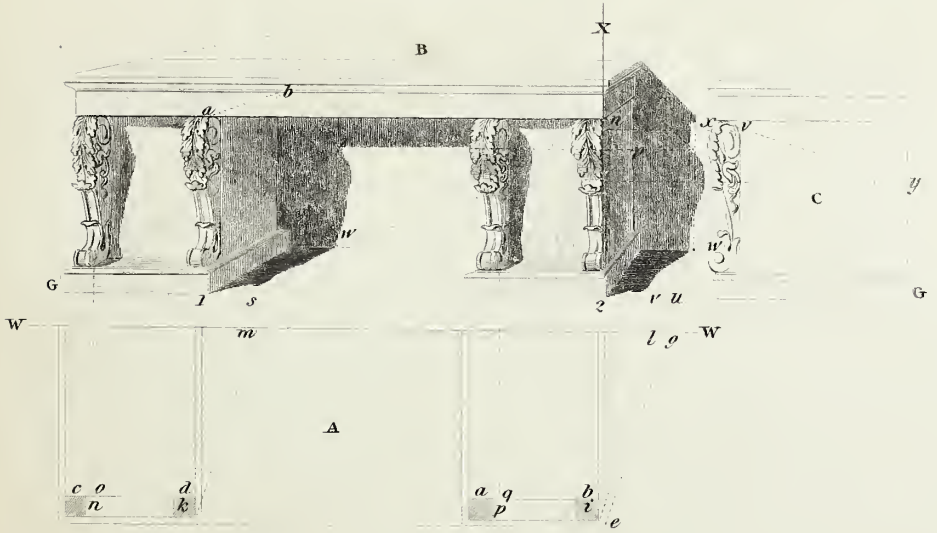
In this plate are given four different objects of furniture; shewing the mode and manner of projecting the cast shadows from the same on a horizontal plane, and also on one perpendicular.

Example 5. Let A represent the general plan of a pedestal sideboard, the same shewing the situation of the four console supports of the pedestals at *a b*, *c*, and *d*. Fig. B represents the sideboard as shewn perspectively, and Fig. C the geometrical profile of its depth. It is required to give to this object its proper proportion of light and shade, and to project the shadows as cast from it on the wall and ground; and likewise to project the shadows from the console supports on the front faces of the pedestals, so as to give to the whole an embodied effect, and convey to the eye a lively representation of what the original piece of furniture would be when executed. To cast the shadows by exact rule from every part of this figure, would require the aid of a great number of lines, and tend to render the process perplexing; to avoid which, we have chose to confine ourselves to a few only of the principal lines, as being sufficient for the purpose required, and all that are necessary for general use.

The student, by the aid of these Examples, will be enabled to project the cast shadows for almost any piece of furniture; the same being applicable to every case that may occur, either to the Upholsterer or Cabinet-maker, as a draughtsman. The first thing to determine on, is the sun's inclination, or seat on the ground with regard to the object as opposed to it: this must be laid down in the plan, as shewn by the parallel line *k m*, *i l* and *e g*. From the intersection of these lines at *m*, *l* and *g*, on the wall line W W, perpendiculars are raised to the base or ground line G G, on which the sideboard or original object is placed; as at *s*, *v*, and *u*. From these points, radial lines are drawn to the station or point of sight S; which give the same points perspectively on the wall line at *w*, and *w*. The next thing to be considered is the sun's declination; or otherwise its particular ascension or descension at some precise period of the day: In design this is entirely arbitrary, depending on the judgment of the artist. It would argue want of taste to

SHADOWS.

Examp. 5.



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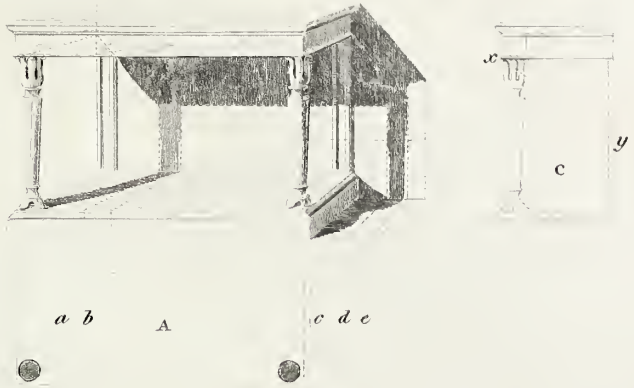
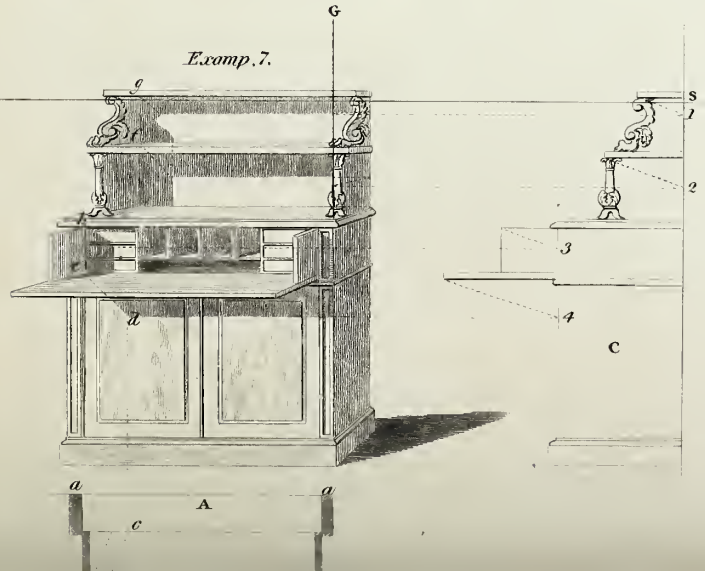


Examp. 7.



Examp. 8.

represent the shadows of too great a length, as supposing the sun to be elevated very little above the horizon; as well as to make them too narrow, by considering the sun as near its meridian, or point directly over our head. In these Examples, the middle course is adopted; the sun's declination being determined by the line *x y* in the profile C. The point where the ray would strike the wall at *y*, would be the geometrical depth of the shadow as cast from the overhanging of the sideboard top and rail: this must be squared across to the geometrical line X at *o*. From this point a radial must be drawn to S, intersecting the back line of the sideboard at *p*, and from thence squared across until intersected by a perpendicular raised from *w* at Z. A radial must then be drawn from *a* on the frieze line, towards the point of sight, intersecting the back line of the pedestal at *b*. A line drawn from *b* to *z*, will give the sun's declination perspectively; to which all the lines projecting the shadows from the pedestals on the wall must be drawn parallel; viz. those drawn from the several projections of the top and rail; these are intersected by a perpendicular raised from *w*, as will be seen by inspection of the figure. The points 1 and *w*, 2 and *w*, being each joined by lines, will give the sun's inclination, or seat on the ground, perspectively; which being continued to the horizontal line, will there meet in the point V, which then becomes the vanishing point for all shadows cast on the ground by such inclination. The intersection of the line *x y* in the profile with the back line of the truss, at *v*, will give the shadows from the over-hanging of the rail, upon the front faces of the pedestals. This being squared across to the geometrical line X as before, and from thence conveyed by the point of sight on the back line of the truss at *n*, will give the depth of the shadow perspectively; which must again be squared across on the pedestals, until intersected by perpendiculars raised from *o* and *q* in the plan. The outline of the shadows as produced by the truss supports, may then be drawn by hand from the points already obtained. Sometimes in large subjects it is necessary to find a number of points for obtaining such outline; but in the present instance this would be attended with a great loss of time, and is not requisite in designs on a small scale.

Example 6, Exhibits a pier table in perspective, the plan of profile of which are here given as in the last Example;—denoted by A and C. The inclination of the rays of light from the luminary are here denoted by the parallel lines *a*, *b*, *c*, *d* and *e*; which are marked by single letters only, to avoid

repetition where so much has already been said in the previous Example. The declination of the rays of light is denoted in the profile C, by the line *x y*. Having projected your shadows geometrically from the plan and profile, proceed and transfer them on to the perspective figure, as directed in the preceding Example. As it is not necessary to repeat the process in this Figure, the learner is referred to the lines as laid down in the same, which, with the instruction already given in the previous Example, will be quite sufficient for him as a guide.

Example 7, Is the perspective representation of a lady's escrutoire. The plan below shews part of the depth of the carcase.

a a shews the thickness of the two ends.

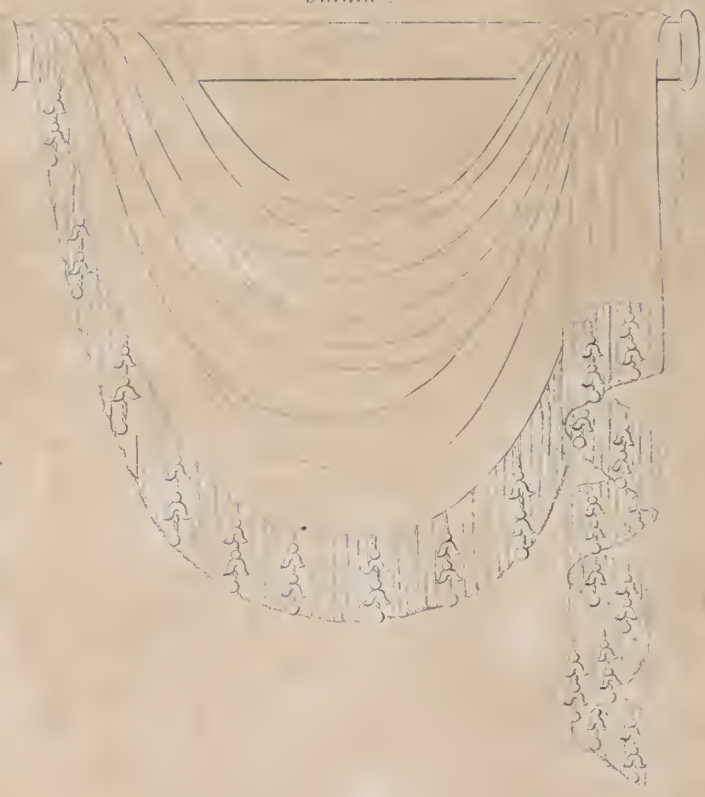
b b denotes the depth of the secretaire drawer when fully drawn out.

d denotes the fall down front of the drawer when in a horizontal position for writing.

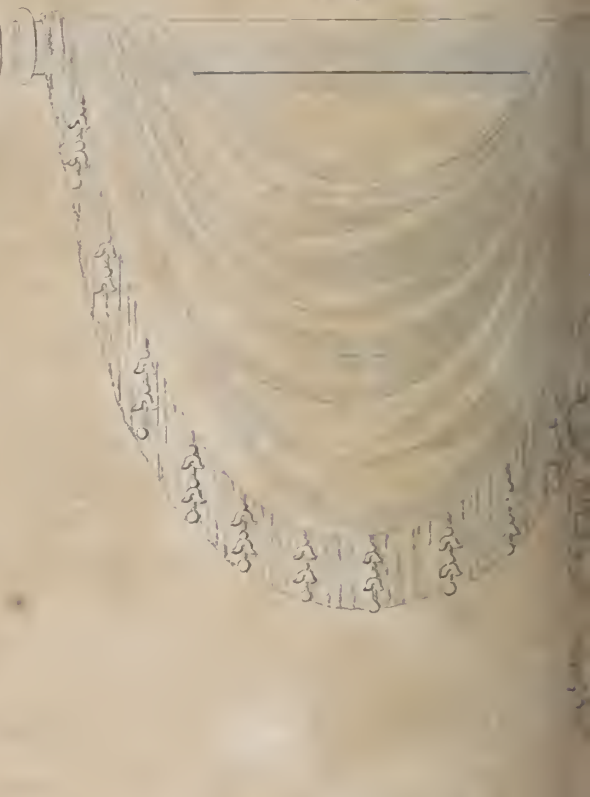
The shadows in this as in the preceding Examples are projected on the plan by the sun's supposed inclination, and those on the profile by the sun's declination. The sun's rays, passing from the upper shelf would strike on the back surface of the object at 1, which would be the depth of the cast shadow. The same ray passing from the second shelf, will give the depth of its shadow on the back surface at 2. The shadow from the side of the secretaire drawer is shewn at 3. The shadow on the doors of the bookcase from the overhanging of the desk is shewn at 4. Commence by squaring these different points (1, 2, 3, 4,) across to the geometrical line G. The shadow cast on the bookcase from the overhanging of the desk in the perspective figure, would be equal to its geometrical depth, inasmuch as it falls on the front face of the bookcase, which in itself is geometrical. This shadow is intersected at *d* by a line squared from the correspondent point *c*, in the plan. A line drawn frem *e* to *d*, will represent the declination of the sun perspectively. The shadows cast from the shelves, would be conveyed perspectively from the geometrical line, to the back line of the figure by the point of sight, and from thence squared across, until intersected by lines drawn parallel to *e d*, from *f* and *g*. A line squared across from 3, until intersected by the inclined line drawn from *h*, will give the shadow as cast from the side of the secretaire drawer on the frame containing the pidgeon holes and small drawers.

SHADOWING.

Outline.



1st Tint



2nd Tint

Finished Example

For the rest the student is referred to the Example.

Example 8. Shews an upright ended chaise longue as drawn in perspective, of which the shadow from the cheek on the back is required. In the plan A, the places occupied by the pillow and bolster are denoted at *b* and *c*, from which are drawn lines parallel to the sun's supposed inclination or seat on the ground, until they impinge on the back; as will be seen by inspection of the figure. What has been already discussed in the previous Examples, will render it unnecessary to say more as regards this; we shall therefore refer the student to the figure, no way doubting but by this time he will be enabled to shadow such simple subjects without further aid or instruction. It will be sufficient in Examples either of chairs or tables, to represent the shadow as cast from the legs, by a mere touch of the brush as shewn in this Example.

Plate CXXV.

It will now be requisite to draw the pupil's attention to the nature of drapery in its outline, which consists of a composition of folds, either broken or forming a continuity one over the other; and this will arise more or less according to the material used. It is almost impossible to make the folds hang in a graceful form where callicoes are used, stiffened as they generally are by high glazing. This is in some measure remedied by the use of woollen of a slight texture, and next to this material, that of undressed moreen; but the most perfect material that can be made use of for producing gracefulness of folding drapery, and which is mostly used in France, is that of silk; which, governed only by its own weight, will fall into those natural diversified folds, known amongst painters, as broken. We have in this plate brought the effect of drapery as near as possible, to the latter remark; and such as wetted linen when suspended would produce. This is done to give the student a freedom of hand in the shadowing of drapery.

Having premised thus much, we shall now proceed with the subjects given in this Plate; referring to fig. A, as an outline, first to be drawn. Fig. B, exhibits the same outline as under the first degree of shadow or tint;

which tint, if in Indian ink, must be mixed up with the addition of a little *Sepia*, as before mentioned.

Fig. C represents the same drapery as under the second degree of tint, leaving a portion of the first tint uncovered; and fig. 4 is the same object under a still stronger degree of tint, leaving a portion uncovered of both first and second tints: but should the pupil wish to give a more determined or higher effect to his drawing, he is at full liberty to darken this, his last tint; taking care to place his darker touches only where the folds of his drapery are the closest collected together; what has been thus far said as to tinting the drapery, will regulate also the tinting of the fringe.

Plate CXXVI.

Fig. 1, in this plate displays the outline of a foliage leaf, taken from an Example of the Corinthian capital, as existing in the remains of the arch of Titus, at Rome. The outline of the leaf must first be correctly drawn with a black lead pencil, agreeably to the directions given in page 135; the same outline may afterwards be drawn in ink with a quill pen, omitting those lines which denote the principal fibres as issuing from the stem.

Fig. 2, which represents the same leaf under its first tint, will give the pupil an idea of the manner in which he must work in his shades.

Fig. 3, shews the leaf in its second stage of tinting.

Fig. 4, offers the same Example under its last gradation of tint, shewing out the leaf with its full effect.

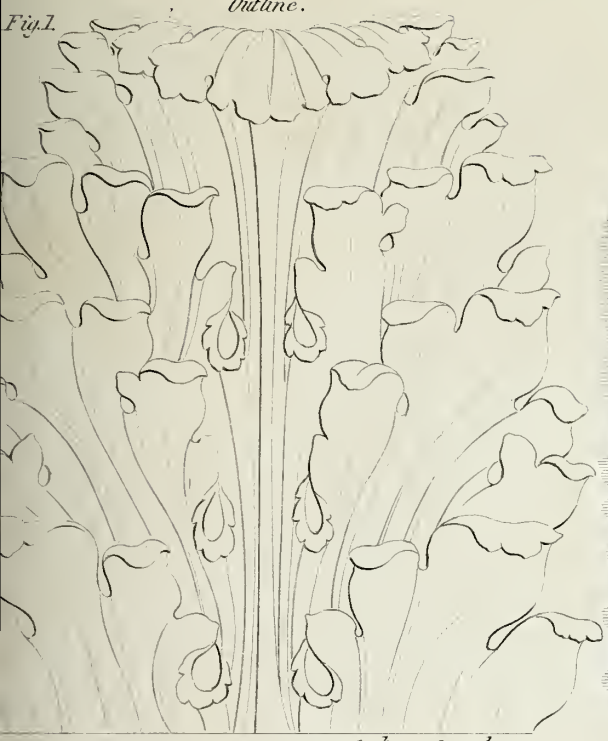
Having prepared the three tints necessary for use as before directed, let the tint for figure 2, be laid on with a full brush, washing in the broad shade from the turnover, together with the shadow cast from the outside of the leaf.

The shades appertaining to the leaves, must then be laid on each separately, as shewn in the Example.

Proceeding next to figure 3, with your second degree of tint, pass over the broad shade at top, observing to omit tinting all the projecting parts, such as the stems and fibres of the leaves under this shadow; this may be observed in the parts marked 1, 2, 3, 4, &c. throughout the Example. By this

SHADOWING.

Fig.1. *Outline.*



a b c d

1st Tint. *Fig.2.*

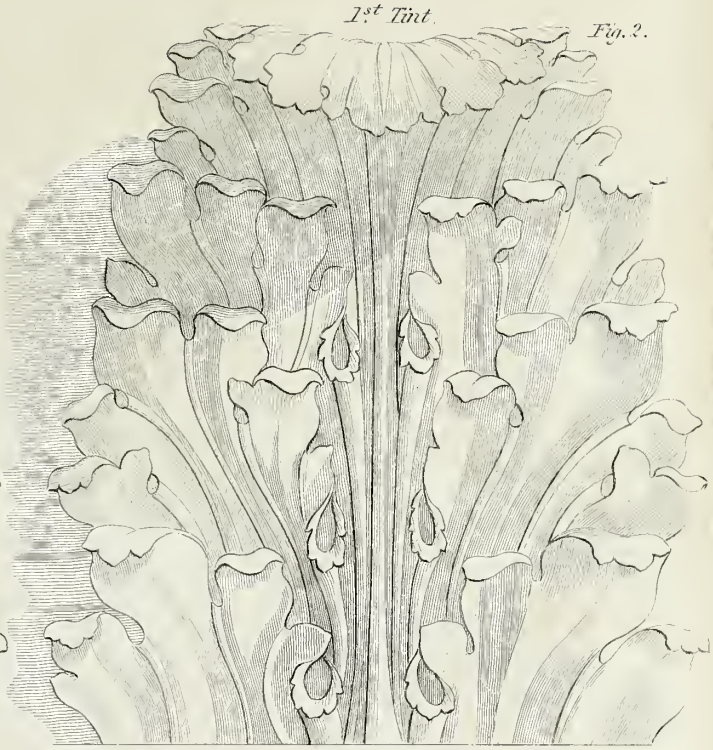
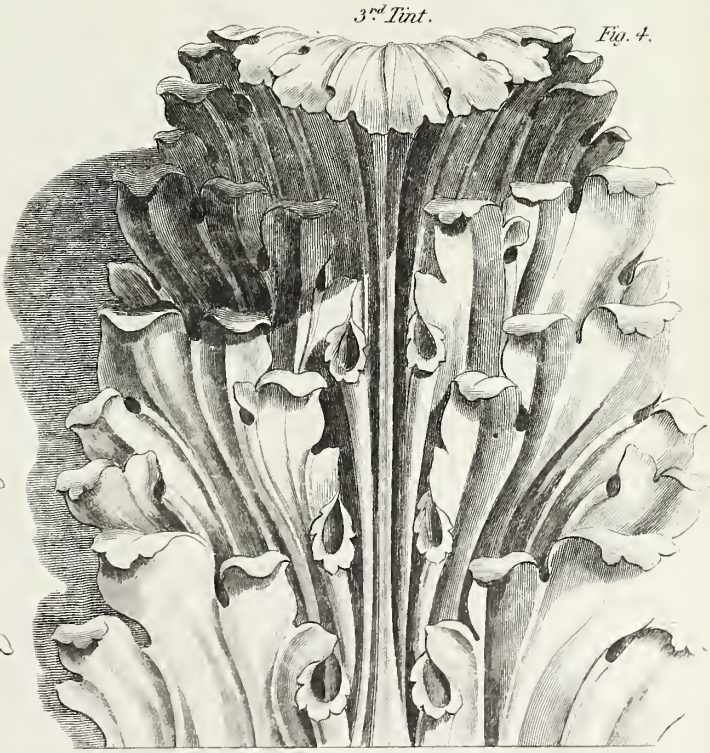


Fig.3. *2nd Tint.*

3rd Tint. *Fig.4.*



London Published by Jones & Co 9 Sept 22 1827

SHADOWING

First Tint

ELEMENTS OF ORNAMENT. I.

process we are taugnt to detach or make such parts appear to project, as we know such to stand the one before the other. In passing over the other parts of the leaf, the pupil will place his second shade over the first equal only to one-third of its breadth, when he may proceed and soften or penumbrate it towards the edge of the first shade. The same is to be observed as regards the shadow cast from the outside of the leaf, which must be so shadowed as to leave a portion of the first tint remaining. With a moderate share of attention and perseverance the student will soon be convinced of the reason by which our practice is enforced.

Fig. 5, represents the leaf under its full effect of light and shade, as produced by the power of tint. It will be necessary to inform the pupil, that the third or last degree of tint must be laid over that of the second, precisely after the same manner as directed above; taking care throughout to leave a portion of the first and second tints visible. A spirit and brilliancy may be given to the drawing by a judicious use of dark and spirited touches, placed in such situation where we know that light would be totally obscured by projection; or where one part (as is the case with ornament in general) would be deeply undercut, and so produce a powerful effect by the opposition of shade to light. We shall now leave the student to make use of his own abilities, merely stating, that without an active exertion he can expect to reap but little advantage.

Plate C.

In this Example the pupil will observe that the general outline comprising the whole of the foliage is first drawn; which outline is again divided into distinct parts, (here shewn by the dotted lines,) each comprising the detail of the foliage: and the whole to be measured from the perpendicular dotted line. What has already been said in the previous Example as regards light and shade in the shadowing of foliage, will likewise apply to this; namely that of laying on the shades with the first tint generally, as shewn in the second Example in this plate, observing that the pen lines in the outline Example be left out in all parts excepting in the outline form of the leaves, and the larger turn overs.

Plate CVI.

The first subject in this plate exhibits the same ornament under its second gradation of tint, to effect which, the pupil is referred to the directions given with Plate CXXVI. With respect to the finished Example in this plate, the pupil is required to make use of his own abilities, as he must by this time have acquired sufficient knowledge to follow his copy without the necessity of any further direction.

These Examples are given, as tending to shew the power of light and shade, with respect to all subjects delineated on a plane surface, giving them the appearance of a positive projection.

In leaving a portion of the three tints uncovered one under the other, consists the art of giving a softness of effect to the drawing, and of gaining a transparency, as has been before observed.

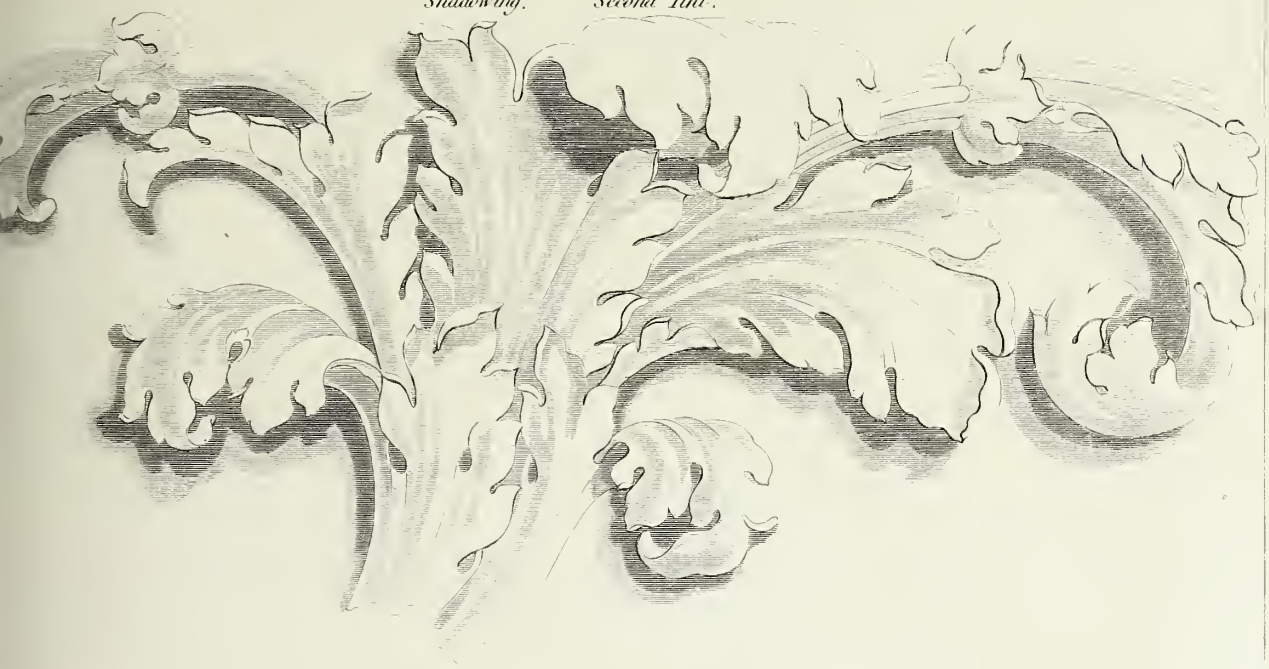
Plate XIV.

The two subjects given in this plate shew in some measure, how far, by a judicious combination of forms, a tasteful design in ornament may be produced; this is what is termed in art, composition; that is, an assemblage of parts so arranged and put together, as to form a pleasing and agreeable whole. Either of the two designs in this plate are well calculated for the decoration of friezes; whether in those belonging to appartments, or in those of cabinet furniture.

Sufficient effect of light and shade is exhibited in these two subjects to enable the learner to shadow such, or similar designs, if what we have before enforced be well studied. We shall here close all we have to say, as relates to drawing, together with the effect produced by mechanism in the management of light and shade, and conclude our instructions with giving necessary directions for the choosing of colours, and for compounding the various tints produced from mixing one body with the other; this branch of the art is commonly termed Colouring.

ELEMENTS OF ORNAMENT.

Shadowing. *Second Tint.*



Finished Example.

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ELEMENTS OF FOLIAGE

COMPOSITION.

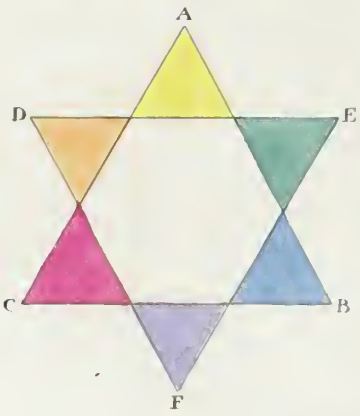
COLOURING.

A.B.C. *Are the three Primitive Colours,* *viz. Yellow, Blue & Red.*

D *Is, Red mix'd with Yellow,* *making an Orange*

E. *Is, Blue, mix'd with Yellow,* *making a Green*

F. *Is Blue, mix'd with Red,* *making a Purple*



PRIMITIVE TINTS,

Nos	Yellows	Nos	Blues.	Nos	Reds.
1		5		9	
2		6		10	
3		7		11	
4		8		12	

PRIMITIVE TINTS, MIXED

Nos	Yellow with Red	Nos	Yellow with Blue	Nos	Blue with Pu
13		17		21	
14		18		22	
15		19		23	
16		20		24	

MIXED COLOURS,

	Yellow with Vermillion		*Burnt Umber with Burnt Terra de Sienna*		*Indian Ink with Carmine*		*Light Red*		*Venetian Red & Blue*		*Ind Raw S carm*
25		29		33		37		41		45	
					Carmine Burnt Raw Sienna & Prussian Blue		*Light Red with Burnt Umber*		*Ditt° more Blue*		*Ditt°*
26		30		34		38		42		46	
	Carmine with Crome		*Yellow Oker with Burnt Sienna*		*Carmine Gamboge Raw Sienna Burnt Umber*		*Light Red. Burnt Umber Burnt Sienna*		*Ditt° more Red & Blue*		*Ditt° w*
27		31		35		39		43		47	
			Yellow Oker, Burnt Sienna Burnt Umber		*As 33 but more Burnt Umber*		*Carmine & Burnt Umber*		*Ditt° more Blue*		*Ditt° more*
28		32		36		40		44		48	
		49			*Crimson Red Carmine & Prussian Blue*	50			*Carmine & Flake White*		

COLOURING.

There are, properly speaking, but three primitive colours; viz. blue, yellow, and red. These colours by a mixture one with the other, will produce three other distinct colours; viz. green, by the mixture of blue and yellow; purple, by the mixture of red with blue; and orange, by a mixture of red and yellow. These various hues will be seen by reference to fig. 1, in the diagram.

Plate CXXVII.

Red, blue and yellow, blended together, will produce more or less as the blue predominates, a dense black, but when mixed in a lighter degree, the tint so produced is called neutral: that is, partaking of many shades of colour, but exhibiting no one in particular. This tint is used for putting the general effect of light and shade into drawings intended for colour: it becomes a proper tint for shadowing all objects that are intended in themselves to appear white; viz. drapery or curtains of muslin, white silk or dimity, in furniture drawing; and lillies, white roses, &c. in flower painting.

Besides the three primitive colours, and those resulting from the mixture of them one with the other, there are other colours of a vegetable, mineral, or earthy origin, all useful of their kind; such are the umbers and siennas (burnt and raw), the yellow and Roman ochres; vermillion, Venetian red, and carmine; madder brown, indigo, &c.

It is usual with many persons when purchasing colours to choose a box containing perhaps from twenty-four to thirty cakes, each of a different tint; a practice not to be recommended. Those already enumerated are all that are likely to be brought into use in colouring either drapery, or cabinet furniture, or any other subject confined to the two branches of Upholsterer and

Cabinet-maker. It remains therefore to give some instructions to our pupil as to the art or manner of mixing the different colours one with the other, so as to enable him to produce the different tints in all their variety of tone, such as may be requisite for his use.

Plate CXXVII.

No. 1, Is gamboge mixed up as a light wash, and is the first tint to be laid on in any subject intended to be coloured yellow; whether drapery, or ornamental work when represented as gilt.

No. 2, Is the same colour (gamboge) worked deeper.

No. 3, The same colour worked still deeper.

No. 4, Is gamboge in its full colour.

No. 5, Is Prussian blue, washed in light, and answers for the first or ground tint, in any subject intended to be coloured blue.

No. 6, The same colour made a slight degree darker.

No. 7, Ditto made still darker

No. 8, Ditto in full colour.

No. 9, Carmine worked light.

No. 10 and 11, Are tints from the same colour, but strengthened in mixing.

No. 12, Is carmine in its full colour.

These being all primitive colours it remains next to proceed with the different tints produced by the mixing of one with the other.

No. 13, Is gamboge with a small portion of carmine, and in this state becomes a shadowing tint for curtains or drapery, when tinted yellow; as also the first shadowing tint for any thing intended to represent gold.

No. 14, Is gamboge with more carmine added.

No. 15, Ditto with a larger addition of carmine.

No. 16, Ditto with a still larger proportion of red.

The three last tints are made use of, in working up the shadows of any subject that is coloured yellow.

No. 17, Is gamboge mixed up with a little Prussian blue.

No. 18, Is gamboge with more blue added.

No. 19, Is produced by the addition of more blue.

No. 20, Is the same, mixed up with a greater proportion of the blue; and then becomes a full grass green

The management of these tints in colouring must be after the same manner as those preceding.

No. 21, Is Prussian blue, with a small portion of carmine, and makes when thus mixed, the first tint of purple, commonly called lilac.

No. 22, Is Prussian blue with a further addition of the red.

No. 23, Is the same blue with a still further addition of the red.

No. 24, Is blue and carmine, each in its full mixture, producing the purple in its full colour.

It now remains to point out such other mixture of tints as are necessary; together with the different substances of which they are composed.

No. 25, This tint is produced by washing over the part to be coloured, first with a tint of gamboge; which, when dry, is glazed over with a tint of vermilion: the colour so produced is called scarlet.

No. 26, Is produced by a deeper wash of the gamboge first laid on, and glazed over with a deeper tint of vermillion.

No. 27, Is produced by a faint wash of crome in the first instance, and afterwards, when dry, glazed over with a faint wash of carmine.

No, 28, Is produced by a wash of the crome in its full colour; the same when dry being glazed over with carmine in its deepest tint.

No. 29, Is composed of a light mixture of burnt umber, and burnt terra de sienna, producing a warm drab colour.

No. 30, Is produced by a stronger mixture of the same colours; making a rich and warm brown. This colour may be used in different degrees of strength for shadowing such objects as are tinted with No. 29.

No. 31, Is produced by a light mixture of yellow oker, with a little burnt terra de sienna added.

No. 32, Is yellow oker deepened in tone, with burnt sienna and umber.

These two tints may be used in colouring any article of cabinet furniture intended to represent oak.

No. 33, Is Indian ink, mixed up with a portion of carmine, producing a purplish tint, and will be found serviceable as a first wash for all cabinet work, intended to be coloured as in rosewood.

No. 34, Is carmine mixed up with raw sienna, burnt sienna, and a small portion of blue; this mixture produces a mellow warm tint, approaching to a marone, and is used in the shadowing of objects coloured as rosewood.

No. 35, Is a mixture of carmine, gamboge, raw sienna, and burnt umber, and may be used for strengthening the shadows of all objects worked up, with the tints 15 and 16.

No. 36, Is the same mixture with a larger portion of the burnt umber, and is used in painting the shadows cast on any object coloured as gold; and also for representing the deeper folds and recesses in yellow drapery.

No. 37, Is produced by a slight wash of light red: in this state it becomes the first or ground colour to be washed over any part of a design, intended to shew as mahogany.

No. 38, Is the same tint deepened with burnt umber, and in this degree of force is used as a shadowing tint for all objects coloured with No. 37, and for giving the imitation of the curls and veining of the wood.

No. 39, Is used for heightening the deeper shadows; and is composed of the preceding tint No. 38, with the addition of more umber and burnt sienna; or the shadows may be strengthened by using the tint No. 36.

No. 40, Is produced by a mixture of carmine with burnt umber, and may be used as a ground tint for colouring rosewood objects, which may again be heightened by using the tint No. 34.

No. 41, Is Venetian red with blue, and becomes, when the red prevails, a warm drab. This colour is useful as a ground for curtains, &c. whose trimmings are intended to be either blue or gold.

No. 42, Is Venetian red with Prussian blue, producing a grey tint; curtains, &c. when coloured with this tint, should have their trimmings of scarlet.

No. 43, Is a mixture of Venetian red and blue; both colours being used strong in tint, but the red the most prevalent. This colour when used for curtains, may have its trimmings of gold or blue.

No. 44, Is compounded of Venetian red and blue, the latter being predominant; producing, by the mixture of the two colours, a deep grey. The mixture so produced may be used as a shadowing tint for curtains or draperies whose ground tint is No. 42.

No. 45, Is a mixture of Indigo, raw terra de sienna and carmine or lake, producing what is termed a neutral tint. The neutral tint is much used amongst artists, in painting landscape scenery or subjects of architecture. In the former, this tint is varied in its mixture or tone according to that portion of the landscape over which any positive colour is to be placed. Thus, this tint should partake more of the blue or grey tone, for some portions of the clouds and distant objects in the landscape; it should be mixed up with more of the red where rocks and warm fore ground occupy a place in the picture, and again this tint should partake more of the yellow when used as a shadowing tint for the green of trees.

No. 46, Exhibits this tint, the red being the prevailing colour.

No. 47, The same mixture used light, the yellow being predominant.

No. 48, The same tint lightly mixed, the blue holding the preference.

No. 49, Is a mixture of Venetian red, crome and flake white.

No. 50, Is what may be termed a lavender tint, and is compounded of flake white, carmine and Indian ink.

There are many other tints to be produced in water colour painting by the mixture of one transparent colour with another; and again there are others that can only be obtained by a mixture of body colour; such are the peach blossom and salmon colours, as No. 49; the lavender tint, No. 50, and many varieties of the drab, but as these will fall more to the lot of the decorator, than to the artist or draughtsman, they are not insisted on in this work: to mix these colours in body, would require personal instruction and much experience; they are subject to many difficulties in the mixing, as being affected either by the too great heat or coldness of the atmosphere.

After having given such ample directions for the mixing of transparent colours, and producing all their variety of tint, it only remains to offer instructions as to the manner of disposing them in any drawing that is intended for colour.

It must be observed in the laying on of colour, or in colouring any particular subject, as drapery or curtains, that the brightest tint of each colour should be first laid on, and that very weak, scarcely exceeding the whiteness of the paper on which it is laid; and let it be further observed that the tint so laid on is to answer for all the high lights of the projecting parts; for example,

in the component parts of drapery and curtains, or the folds of such. As certain portions of such folds have their upper parts wholly exposed to the rays of light, and are generally of a round figure, in such case, that part the most opposed to the light would offer a tint highly under illumination, and of course be fainter and brighter in its appearance than those parts receding from it; the full colour being alone exhibited by those parts the most under the influence of shade: upon this principle consists the necessity of gradation of tint in colouring; on the successful application of which, depends more or less the realization of those appearances we see in nature.

Let it here be impressed upon the student's attention, that in laying on his tint, he be careful not to cover either the first, the second, the third or the fourth tint entirely, but to leave a portion of each visible, reserving his darkest tints for those parts the most removed from the effect of light; which in the end will give life and spirit to his drawing. With this we shall conclude the instructive portion of our work, convinced of the aid it will afford in rendering the assistance of a master more effective, which at all times cannot but be of service, inasmuch as explanation by word of mouth is often better understood than much reasoning on paper. With an earnest desire that his limited knowledge may prove of service to his friends and students, the author here consigns them to their own studies, trusting the helps he has afforded them throughout the whole of the work may be found real and beneficial.

He has not withheld any thing however trivial, that could be of real service; and he has studiously endeavoured in plain and distinct terms to elicit what he wished others to comprehend as well as himself. Having said thus much, the remaining portion will henceforth consist in explanatory descriptions of the different designs of furniture introduced throughout the work, together with their uses, mode of manufacture, &c. We shall first commence with those of decoration, as they are exhibited in the plates, offering such remarks as the change of fashion and times have occasioned.

INTERIOR DECORATION.

In the earliest period of the annals of mankind we find sufficient proofs of the existence of a taste for architectural and ornamental embellishment. Not to go further back than the period in which architecture flourished amongst the Egyptians, we find in the ruins of their temples, their catacombs and obelisks now existing, many examples of ornamental decoration, evidently the work of hands, superior in talent to the common idea hitherto entertained of their knowledge in works of art. The variety and beauty displayed in the capital of the columns in the remains of the great temple now existing at Apollonopolis Magna (or Edfou) in upper Egypt, exhibit as much taste in their design, as excellence in their workmanship.

Whether the Hindoos derived their taste for architecture and ornamental embellishment from the Egyptians, or the Egyptians from the Hindoos, can be but of little moment at this period: it is sufficient that we observe in the works of both nations an accordance and similarity as to the disposal of their parts into imposing and gigantic masses. Amongst the ancient Greeks we find decorative painting and sculpture carried to a great degree of elegance in almost every instance; as may be seen in the ornaments belonging to their temples, their vases and other works of art. To these succeeded the decoration of the Etruscans, a Grecian colony, visible in the remains of their public and private buildings, baths, &c. lately discovered at Pompeii and Herculaneum. From the era of this people, we pass on to the time in which the arts of design flourished amongst the Romans, when decoration may be said to have reached its zenith; and here we have abundant examples in their altars, vases and candelabri; in the baths, of Titus, Nero, and Dioclesian; and likewise on the walls of the catacombs at Naples and its

neighbourhood. Passing from thence to modern times, we have to notice the style of decoration practised in the 15th and 16th centuries, in the times of Leo X. and Julius II. when Michael Angiolo, Raffaelle, and other eminent men of genius flourished, whose works may be seen in the Vatican and palaces of modern Rome; and likewise in many of those in the neighbouring states of Italy, as also in various parts of France. However much we may admire and become prejudiced in favour of the light and airy style reigning throughout, and almost peculiar to the whole of the Grecian ornament, we cannot but feel a sensation of pleasure and gratification in contemplating the breadth, freedom and manly boldness of effect displayed in the ornamental productions of this age. The works of *Jean le Pautre*, who flourished in the age of Louis XIV. of France, (although this period was productive of a bad style) are distinguished by their variety and peculiar happiness of invention. It may not be paying an exaggerated encomium to our neighbours the Franks, when we assert the superiority of their inventive faculty in the ornamental parts of design. We have however in the present day many decorative artists, (natives of our own soil) of great merit, some of whom possess uncommon versatility of talent; performing equally well both in oil and distemper colour, the three branches of decorative art; viz. figure, landscape, and oruamental painting in all its variety; as the numerous works of Mr. R. Jones (who stands at the head of his profession) sufficiently testify. Amongst the many proficients in this department of art we must not omit to mention Mr. R. Nelson, whose abilities entitle him to great praise, and to whom the Author feels himself indebted for many valuable practical hints. Several others might be here enumerated, but we shall close this article by merely intimating that the present work will contain specimens of all the different styles of decoration, such as may be found useful to the decorative artist of the present day; the same being selected from remains handed down to us, of the Greek, Etruscan, Roman and Saracenic or Gothic styles. Specimens will likewise be given of that of the Franks in the age of Louis XIV, together with the present prevailing taste now in vogue in our own island Great Britain; all of which will be noticed in the descriptive account accompanying each design.

Corner Ornaments for Panelling Rooms, &c.

Plate XXVIII.

In this plate are given four different designs for corner ornaments in the Grecian style, intended each as a finishing for the four angles of the compartments in a room where the walls are divided into panels. These ornaments are worked in various ways; sometimes carved and finished in gold; on other occasions painted in oil or distemper, as representing the effect of basso relievo; and frequently executed by the French in a style which they term Rehaussée D'or: which is done by a species of hatching in gold on a dark ground, where the gold itself forms the high light; or where such species of hatching in gold is relieved by dark shadows on a light ground. There is extant a print after one of the old masters, heightened in gold after this manner on a brown ground, and which is commonly called the golden print; it is now extremely scarce. A very chaste style of decoration consists in making the ground or panels of the room of an even light colour; for instance, a very pale *drab*, a peach blossom, a stone colour, &c.; the stone colour decreasing in force to almost a white, and approaching nearly to a cream colour. In all these cases the style of the panel may be of a similar colour as the ground, but worked darker for the purpose of giving the appearance of projection to the panel itself. A gold moulding placed round the walls under the cornice above, over the dado or plinth below, as well as up the angles, internal and external of the apartment, will in this case make the finish. Where the corner ornaments are carved and gilt, the straight mouldings betwixt them forming the panels must be of gold also. In cases where the ornaments are painted, the mouldings apparently parting from them should be painted also; which may then be relieved from the ground by a dark line underneath, and a light one above: the same is to be observed in relieving the ornament. It is necessary to state, that this species of ornamental decoration is alone to be adopted in drawing rooms and boudoirs. The ornament in the middle of the plate will answer as a central ornament in decoration; whether upright or horizontal, in carving or painting in relief.

Plate CXXXIII.

The four designs given in this plate, and numbered 1, 2, 3 and 4, are intended as corner pieces for the decorative panels of drawing rooms. The observations given in the description of plate XXVIII. will render further explanation on the subject before us unnecessary: they are introduced for the sake of variety, and to assist the decorator in selecting or choosing from the whole. It is not intended that the designs throughout this work should be copied or adopted precisely as they are here given; if they afford hints and materials for composition to the artist, it is all the author has aimed at. Nos. 5 and 6, are intended as designs for the decorating of friezes, either in painting, carving, or casting in metal.

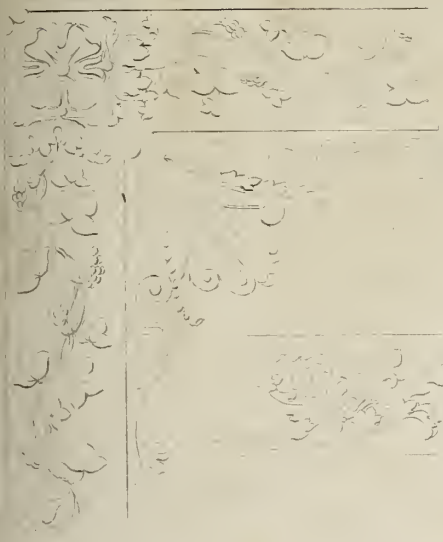
Plate LXXXV.

In this plate are given three designs for ornamental Pilasters, intended to be painted in distemper or oil, and subject as to colour, to the same rules as laid down in plate XXVIII. It may be observed that the ornaments on these Pilasters are often painted in a variety of colours, and thus called Arabesque; such are the Pilasters in the Vatican at Rome. The situation which these Pilasters generally occupy in apartments is the space between the ornamented panels. Rooms when decorated with such an arrangement of ornament, will always present a pleasing and imposing effect; particularly when executed with taste by the artist, as regards light and shade.

Plate LXXXVI.

In this plate is exhibited a portion of that side of an apartment appropriated to the chimney; the same shewing the chimney-piece, with its glass and ornamented frame above, which should be finished entirely in Or, Matt and burnished gold. On the external Angles, marked A A of the chimney

1

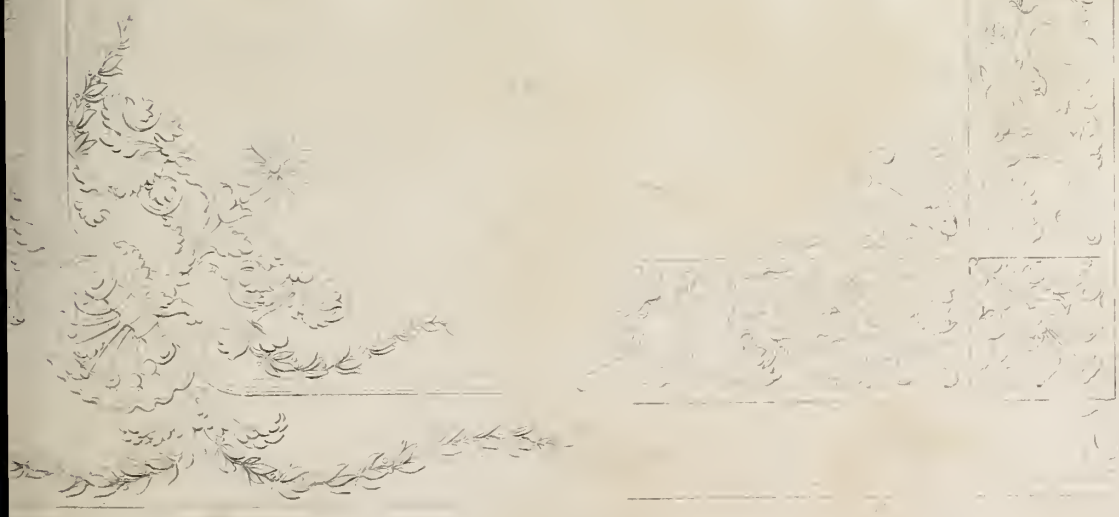


2

3

6

4



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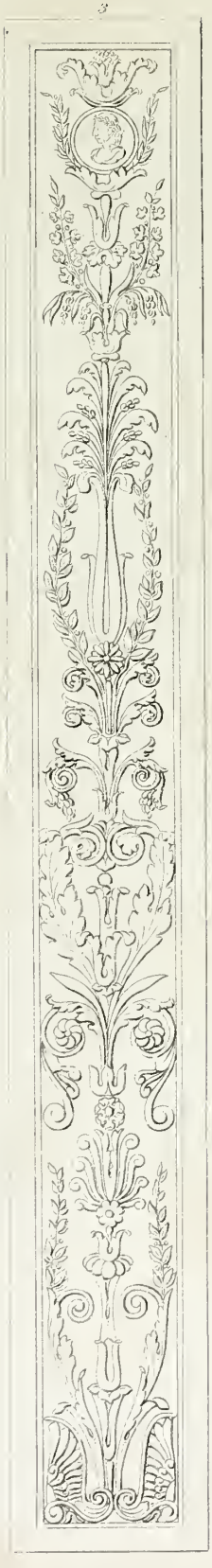
DECORATIVE PILASTERS.

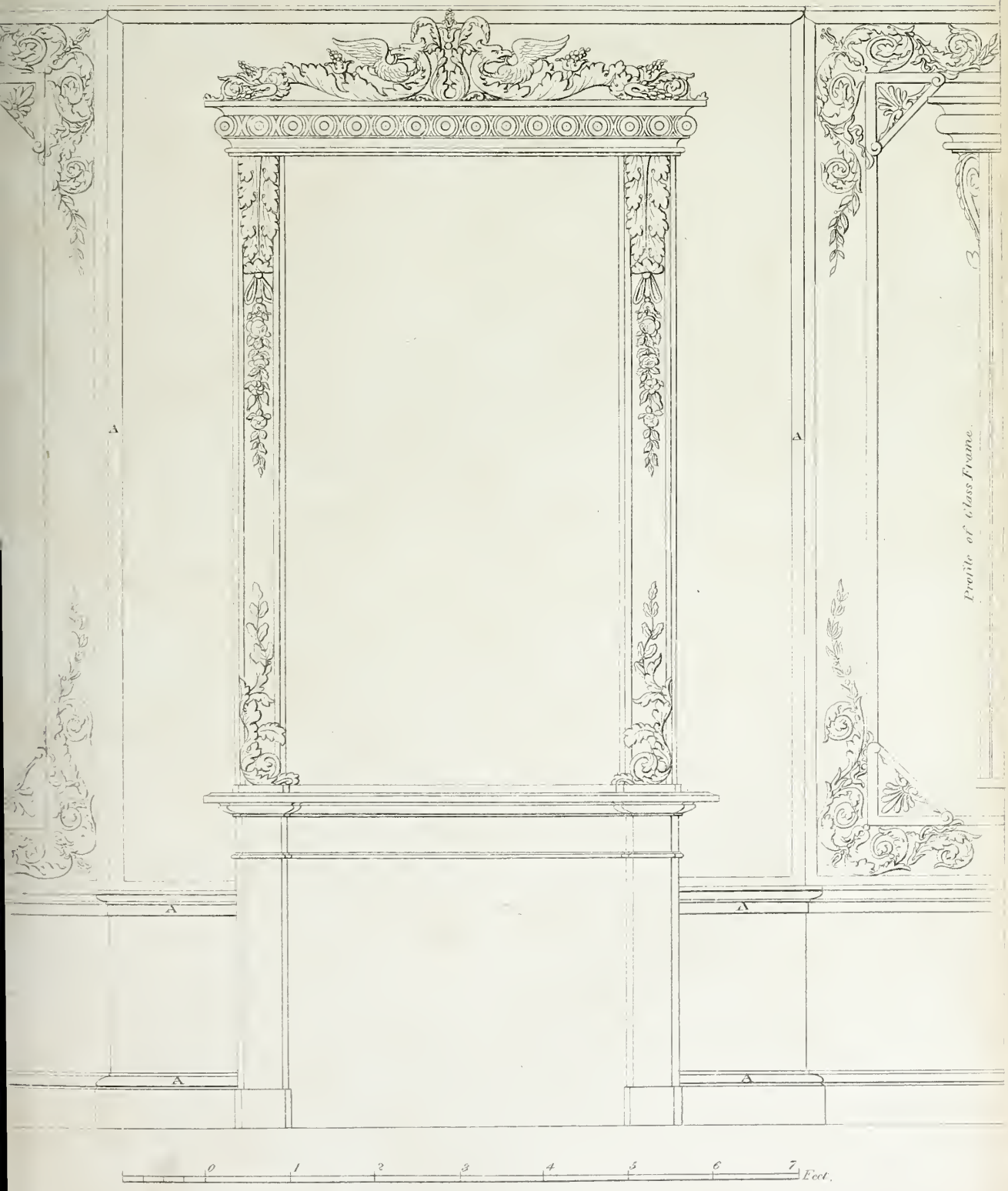
1

2

3



CHYMNEY GLASS & DECORATION.



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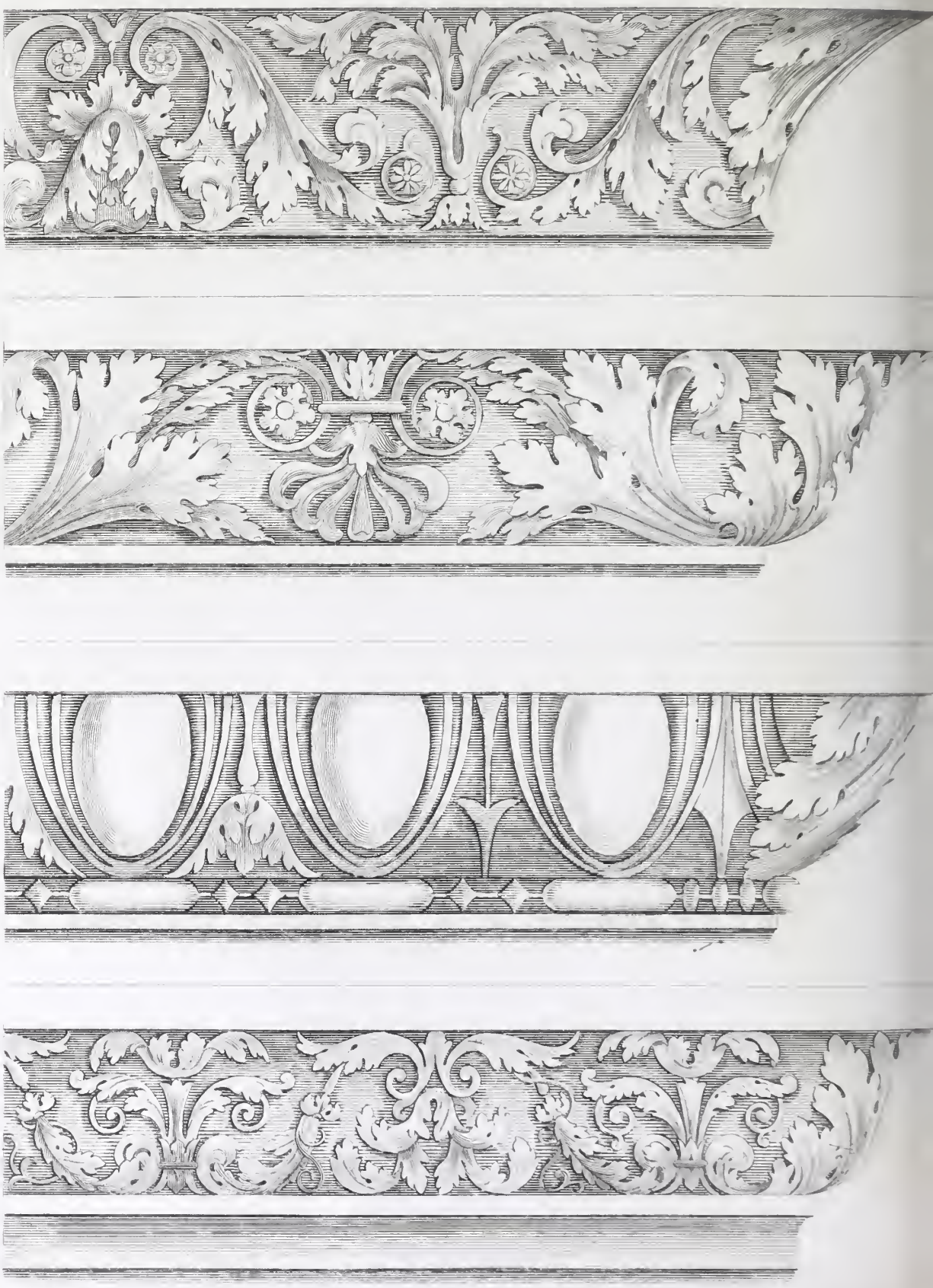


breast, are to be fixed gilt mouldings. In handsome apartments, the base, and surbase mouldings of the dado, marked A A, are frequently finished in gold. A gold moulding to suit, should be carried round the room under the lower member of the cornice at top; and over the upper member of the dado at bottom. The internal angles should have a double moulding, the reverse of those that are on the external angles of the chimney breast. A portion for the decoration of the panels, right and left of the chimney breast, with their ornamental corners is likewise shewn in this plate, together with the profile for the glass frame.

Plate XXXIX.

Four designs for mouldings fully enriched are given in this plate, which may be used for various purposes: viz. for the cornices of windows, in which case they are intended to form the upper mouldings, and should be carved and finished in gold; or, where the expence becomes an object, the ornaments may be procured in composition. These mouldings on a smaller scale may be accommodated for cabinet furniture, and may be either cast in metal or carved in wood. The Greek frett, and Italian guilloche, of which we have given examples in plate XL. may be as variously applied in Decoration: for example, the frett may be adopted to ornament the frieze of an entablature; or it may form the border round the soffit or ceiling of an apartment, either in stucco or in painting. In many cases it forms a beautiful border surrounding panels.

The guilloche is peculiarly adapted for soffit decoration, and may when cast in metal be used with great advantage in Cabinet work; it may likewise be used with good effect in the ornamenting of glass frames.

Plate CXLVII.

EGYPTIAN DECORATION.

This plate and the three that follow it, offer in themselves specimens of the different styles of decoration in use amongst the antients, but adapted to our modern English apartments. We shall commence with the style of the earliest known period in which painting was practised, viz. that of the Egyptian; and although there exists not at the present time a vestige of any of their private buildings or Palaces, yet we have sufficient specimens still existing in their temples, grottos, &c. from whence a style after their manner may be drawn: this has been successfully attempted by the elder Piranese in his design for a coffee-room at Rome, as shewn in his works; but it is too close a copy of a style and manner which in all its parts is massive and colossal. We have in this plate endeavoured to preserve the character of the Egyptian style without following its heaviness; adopting the design for a library, of which the draught before us forms the entrance side. The casing for the doors is copied from the doorway or entrance as seen in most of the Egyptian temples, than which, no form can excel it for beauty. Vitruvius has followed the same outline in most of his doors and windows, and we find the same form still existing in the remains of many of the Grecian temples at Athens. The colour for the walls of such a room may be that of a warm stone, or what is otherwise termed a drab colour; round which may run a style or margin of a deep blue, the ornamental decoration on which should be of raised gold: the frieze also should be worked after the same manner. The four angles of the room may receive a moulding in the form of a palm tree stalk, and crowned with a palm foliage, spreading itself on each side the angle. Over each door-way in this design are paintings, the subjects representing two out of the ten plagues of Egypt; the other two pictures may represent the portraits of Cleopatra and Antony. The bookcase will be seen to partake of the general form and character of the Egyptian temple, before the pilasters of which are placed bronzed figures

of Osiris and Isis and other Egyptian Deities: all the other embellishments in this apartment should partake of a similar character. The doors being deeply thrown back, may have their jambs fitted up for the reception of books; and it would likewise be advisable to cover the doors themselves with sham books. Under the hand of an intelligent and clever Artist, a room might be fitted up after this manner, possessing a light, yet imposing effect; although we are fully aware that this taste has been anathematized as barbarous, arising chiefly from the very injudicious manner in which it has been adopted.

Plate CXLVIII.

GREEK DECORATION.

Notwithstanding the ruin and desolation which the Grecian states have undergone during the lapse of ages, and by the hands of barbarians, who have from time to time made themselves masters of that part of the world; we have still sufficient proof left of their refined taste in what relates to Architecture and Ornamental Sculpture, as seen in those chaste and magnificent structures, their temples. Amongst the Greek Artists, we find their taste for design exhibited not only in their larger works, but extended even to the smallest vessels in domestic use; and although we have no existing remains of any portion of what constituted their private buildings, yet it may be presumed that their Princes and Nobles resided in palaces and mansions suitable to their rank and taste.

The numerous remains of sculpture in columns, pilasters, mouldings, panels and other portions of decoration, many of which have been brought over to this country, are the only grounds on which we can hazard a conjecture as to what may have formed the feature of the interior decoration of their houses. In the absence therefore of other information, we have ventured to give in this plate a design of what may be termed an apartment decorated after the Grecian taste; compiled from the materials already

alluded to, and suited to the general proportion of our modern houses. This apartment may be considered as a withdrawing Room, being connected with that considered as the principal or state drawing room.

As very few even of our best modern houses can boast of much profusion of architectural embellishment, we shall presume that the whole of the decoration in the plate before us to be entirely the effect of painting either in oil or distemper; the sofa and tripods forming an exception: the first an article of indulgence, the two other *meubles* forming receptacles for flowers or perfumes; being appropriated to the same use as the larger Chinese vases, and which when filled with the leaves of dried flowers and other aromatics, is termed by the French, *une Pot Pourri.* It is needless to enlarge further on this plate, as we shall have occasion to make some observations on the design in the next, which may be applied to this likewise.

Plate CXLIX.

ETRUSCAN DECORATION.

The design in this plate is after the taste which prevailed amongst the Etruscans at Pompeii, a part of Magna Græca, where many of the Roman nobility erected their villas. The subject of the present plate forms a design for decorating the walls of a morning room; and is composed from the paintings in Fresco recently found on the walls of an apartment in the Villa of Marcus Arius Diomede at Pompeii. The execution is evidently by the hands of Greek Artists; as are also those paintings found in the villas of — Acteon, and C. Vibius Pansa* in the same town. There is a great degree of taste preserved in the arrangement of the colouring; for we find the panel forming the body of the wall, kept of a light colour, and producing the effect of projection when opposed to the

* Pansa was one of the two last Consuls who enjoyed the dignity of chief Magistrate before the decline of the Roman Empire; he pursued the assassinators of Julias Cæsar, and was killed in a battle near Malina; some suppose he was put to death by Octavius by the means of poison.

style or border surrounding it, such style being painted in a deeper tone of the same colour. It is evident that these Artists were not unacquainted with the science of perspective, which the effect produced in the original painting from whence this design has been composed fully proves, added to which, in the original, there reigns throughout the whole, a lightness and a fantasy of design, highly pleasing to the eye.

Plate CL.

OMAN DECORATION.

As with the Grecian states, so it fared with the Roman Capitol; no mark or vestige being left remaining of any of the splendid palaces and mansions which existed during the Augustan age, or that embellished Rome under the reigns of her Emperors. It is from the many fine sculptured candelabra, marble vases, statues, consoles, pilasters and panels found amongst their ruins that we are alone enabled to form any idea of the magnificent arrangement and decoration of their apartments. The present design pourtrays one side of a large dining room, with its decoration; the same consisting of Corinthian pilasters, the spaces between which are made out with ornamented panels. The centre of the side is occupied by a niche intended to receive either a single or a group of figures; or otherwise a glass, having a side table under it; the whole of which arrangement of decoration with the candelabra placed between the pilasters, we may venture to term after the manner of the Roman costume.

Plate CLI.

GOTHIC DECORATION.

With the destruction of the great Western Empire by the northern hordes, vanished all the remains of private grandeur, as raised by the

luxury and great wealth of the Greek and Roman princes and nobles. And here a long blank! a dreary wilderness of space intervenes, under which every thing relating to art, learning and literature became dormant. What formed the style or character of the habitations, the palaces or residences of these barbarians we are unacquainted with. Suffice it to say that from this general ruin, arose a species of architecture drawn from the intersection of the Roman arch, the one crossing the other at an angle of 45 degrees; this intersection when made by semicircles, was found to produce the pointed or lancet shaped arch. On the other hand, when the height of the arch became less than its span, then such diagonal arch became eliptical and much flattened; this species of arch was the earliest in general use in England, and both the one and the other, viz. the lancet and eliptic forms were called Gothic, however improperly; which have nevertheless been brought to very great perfection, the proof of which may be seen in many of our antient cathedrals. In this plate is offered a design after the Gothic style; a style well suited for country residences. It has been a great mistake with most persons who have supposed, that because the building partook of this peculiar style, that the furniture was designed after the same fashion; the contrary of which is proved to be the case; for in those days the furniture for domestic use was massive and heavy, consisting chiefly of bold and highly relieved mouldings, with other members partaking of the round and cable form. Many of the ornaments used about their *meubles* may be called Arabesque, and in some cases they partook very much of the grotesque.

Plate CLII.

DECORATION OF THE AGE OF LOUIS XIV.

The subject of this Plate exhibits a specimen of the taste that prevailed in the age of Louis XIV. and displays the style of decoration used during that period, in the best houses of the nobility and gentry in France. We generally find the walls of most of their apartments divided into compartments and ornamented with pilasters, painted frequently in imitation of the finest marble; and sometimes panelled out, and decorated with richly carved ornament. The mouldings around the panelling on the walls were usually of a very bold projecture, and wholly enriched. Most of this species of decoration was executed in Norman oak, and would frequently be partially gilt; and the interior panelling, if not left in the plain oak, was generally filled up with the finest Coblentz tapestry.

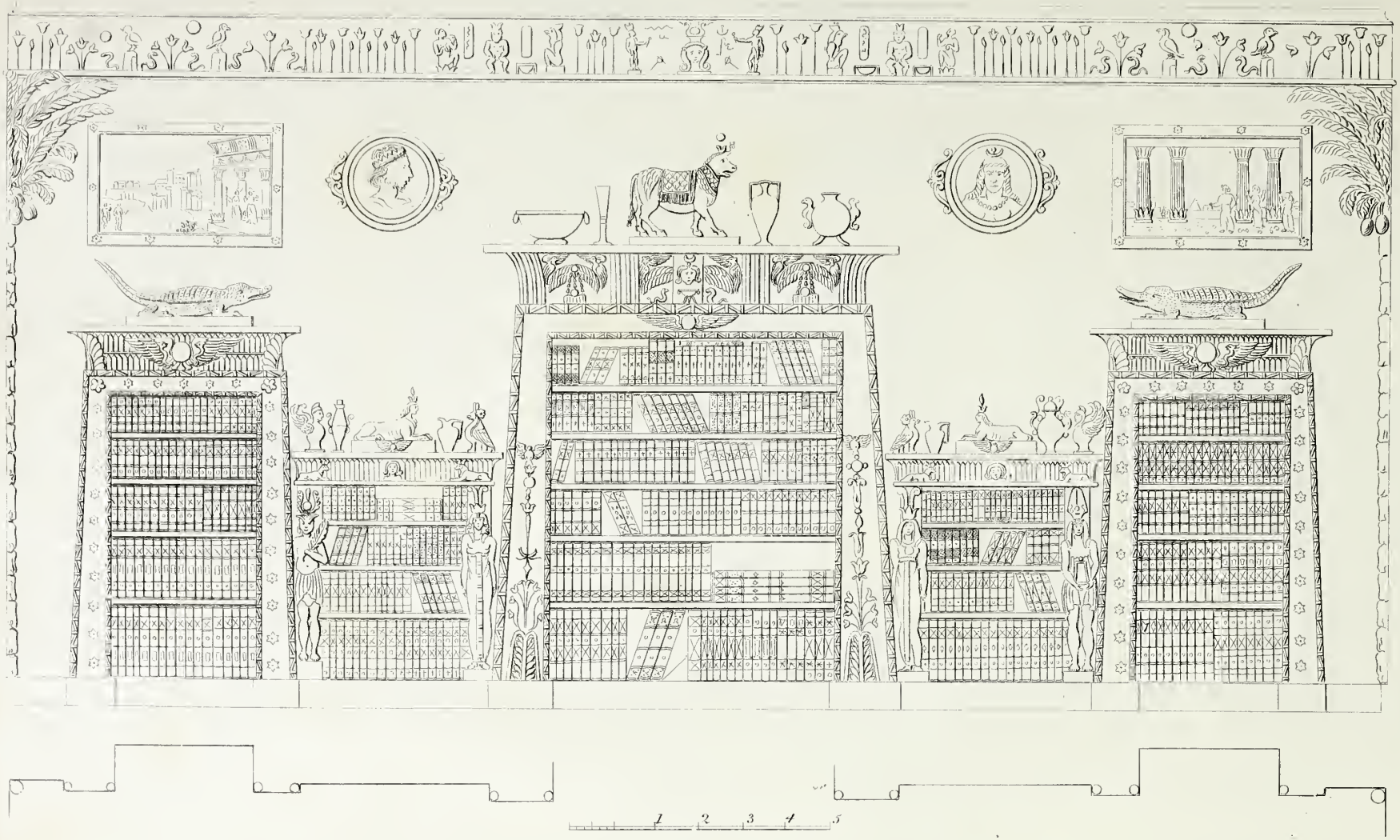
If we refer to the *Meubles* or *Garniture* of these apartments, we shall find them to partake of the same boldness of form and enrichment of detail, as displayed in the architectural embellishment of the rooms. In most of their tables, the tops were of the finest and variegated marbles, around the edges of which would be fixed a bold projecting moulding of brass, chased and gilt; and the frieze or rail under the moulding was frequently enriched with finely executed ornaments in *Or Molu*. The pillars or supports to these tables were sometimes of a turned form, and richly decorated; at other times the supports would be composed of grotesque chimera figures and foliage ornament associated together: a plinth, either of fine marble, or of wood, wholly carved and gilt, would form the base for this enriched table; the back ground of which was universally fitted up with silvered glass. The chairs, sofas, candelabra, tripods, glass-frames, &c. each, and all partook of the same splendid style of enrichment; and although there might and did exist, a bad taste in the design and arrangement of many of the parts composing the whole of this style of decoration, yet it has never been surpassed by any other taste for richness and splendour of effect. It is alike suitable to the kingly palace, as it is to the mansion of the nobleman; but is no ways answerable to the dwellings of persons of small fortune. This

style of decoration has lately been introduced by Messrs. Philip and Benjamin Wyatt, in the building newly erected for Mr. Crockford in St. James's Street; in direct opposition to the chaste Grecian taste of the late Mr. James Wyatt, his late Majesty's surveyor-general. As this mansion is solely appropriated to nightly purposes of pleasure, perhaps such a taste may be in unison with the wasteful transfer made of property in such establishments. From the extravagant expence attending it, such a style of decoration cannot be recommended, except in instances wherein property would justify its adoption.

Plate CLIII.

The style of decoration exhibited in this plate may properly be termed French, inasmuch as it was first introduced into this country by certain French artists, brought over from France by Messrs. G. and F. Echardts; who not only engaged in their service the most eminent decorative painters, but also those excelling in the flower and landscape departments. These efforts, although aided at the time by English property, yet the expence in execution was found too great for general use; nevertheless the taste was not altogether lost on our native artists, who, improving upon the lessons of their neighbours, have succeeded in producing a similar effect at a much less expence; for what before was only effected by the hand, has now been accomplished by the art of printing.

A different style of decoration has lately been introduced from France by the manufacture of a composition of paper into every species of ornament, whether for the walls of an apartment or interior decoration in general. This species of manufacture has been called Papier Maché, which in fact is nothing more than paper reduced to paste, and then forced into moulds of the form required. In this instance we now excel our inventive neighbours in the execution of the same article; the English manufacture being more durable as well as more imitative of real carved work, from its sharpness of edge and depth in cast. But with respect to the elegance and phantasy of design in paper decoration, the French offer patterns very far superior to all others; this may be accounted for from the great inventive faculties of some of their first rate artists, being men who have acquired and possess a taste for the beautiful, and



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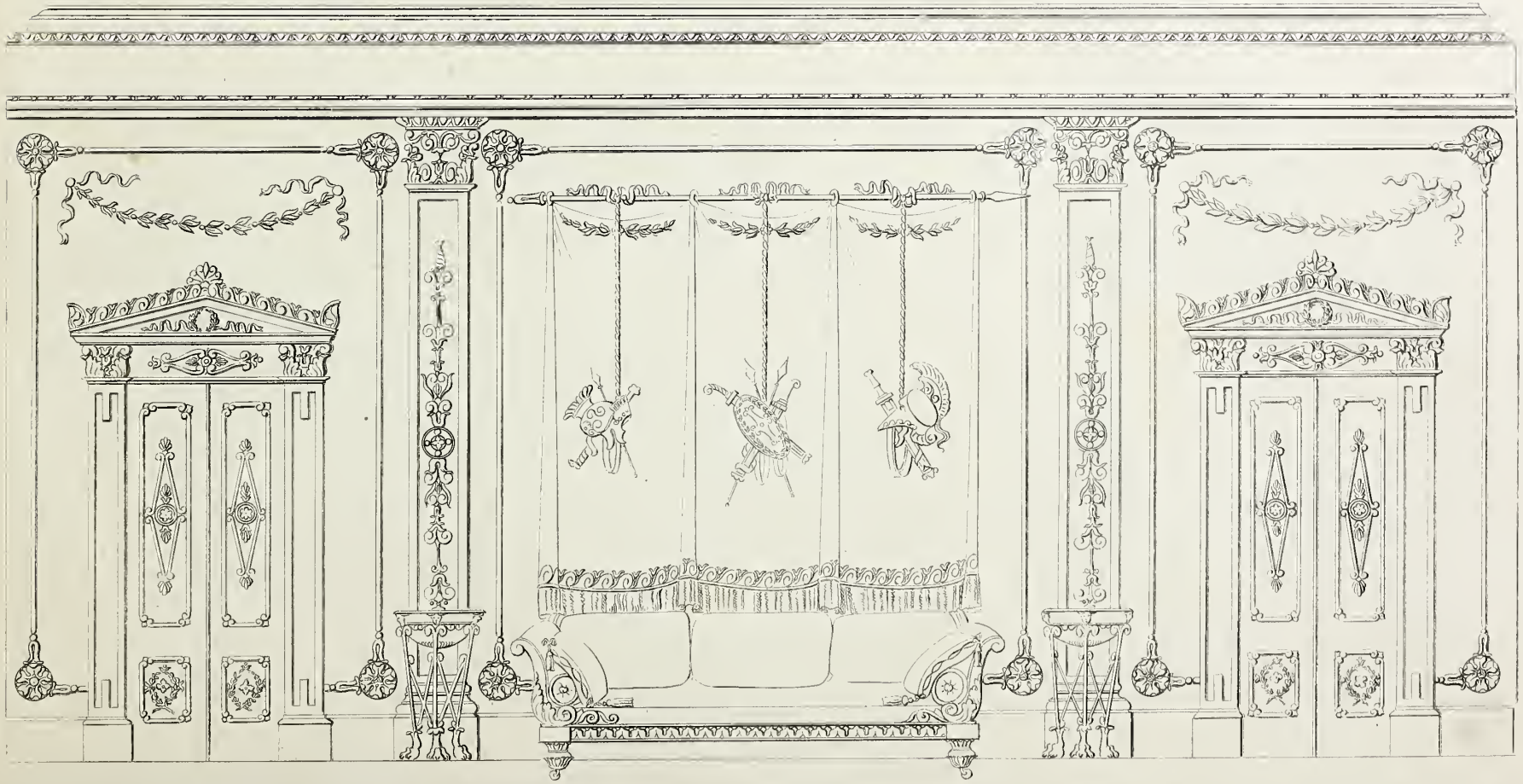
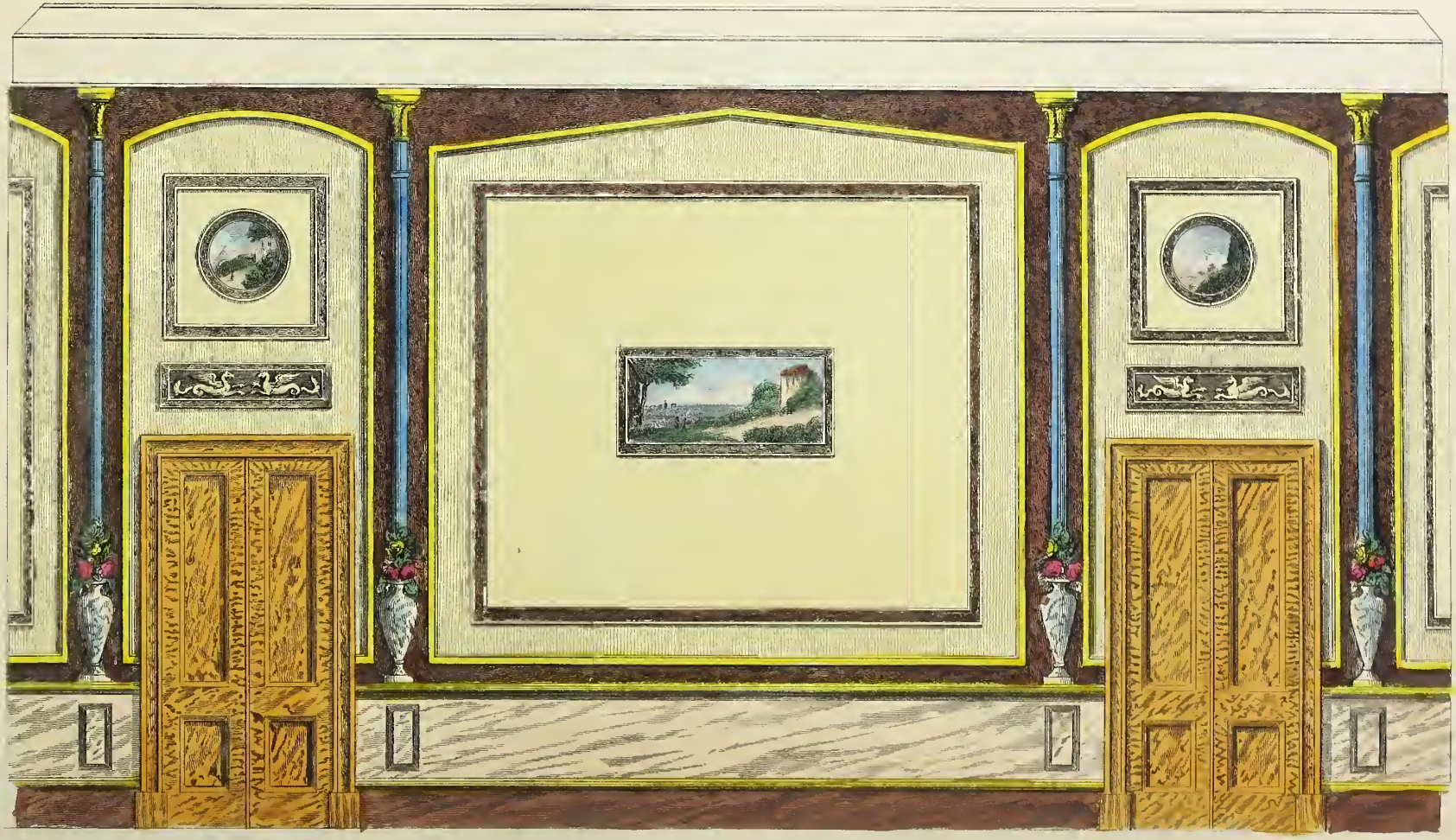
INTERIOR DECORATION.

Greek.



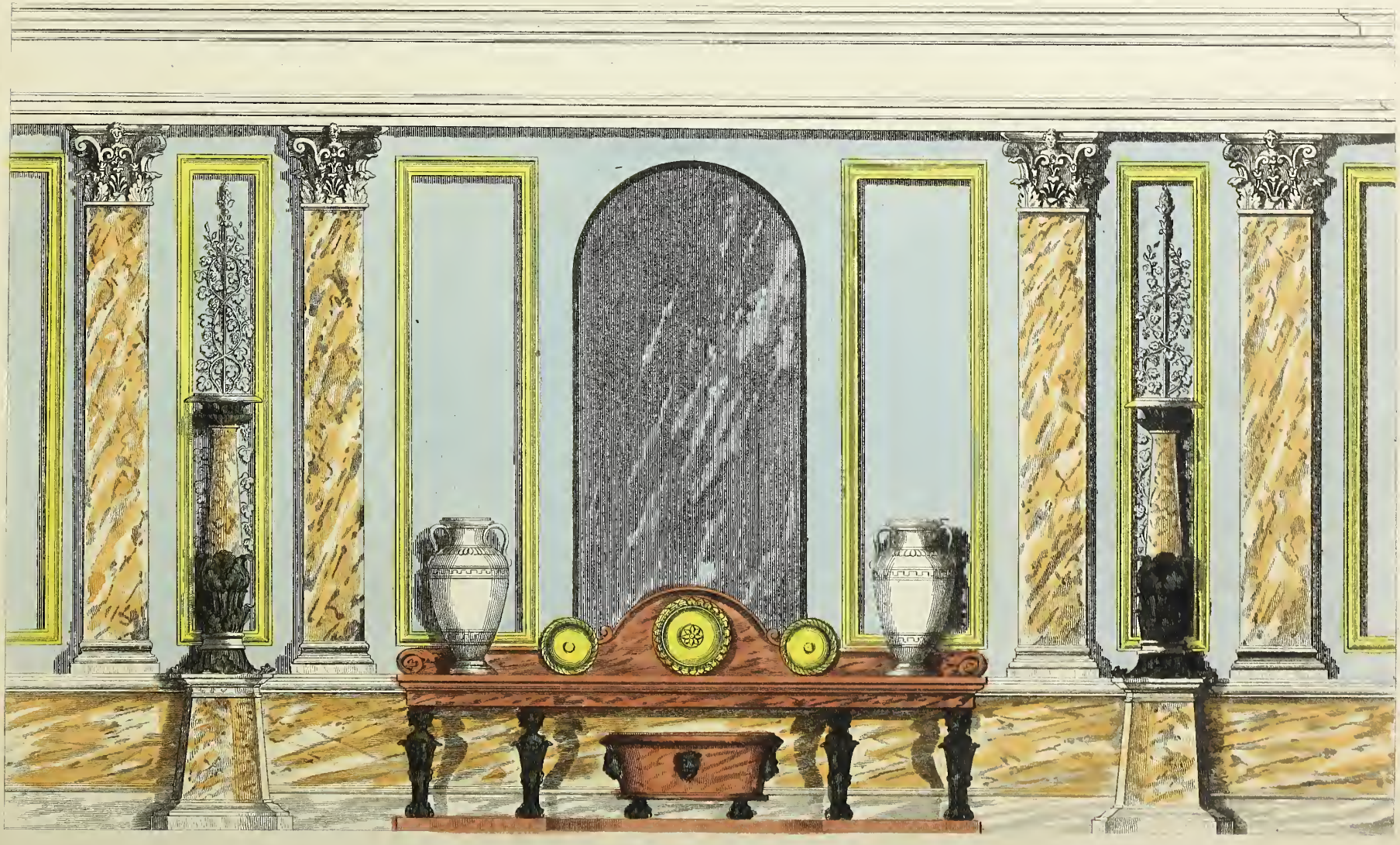
INTERIOR DECORATION.

Etruscan.



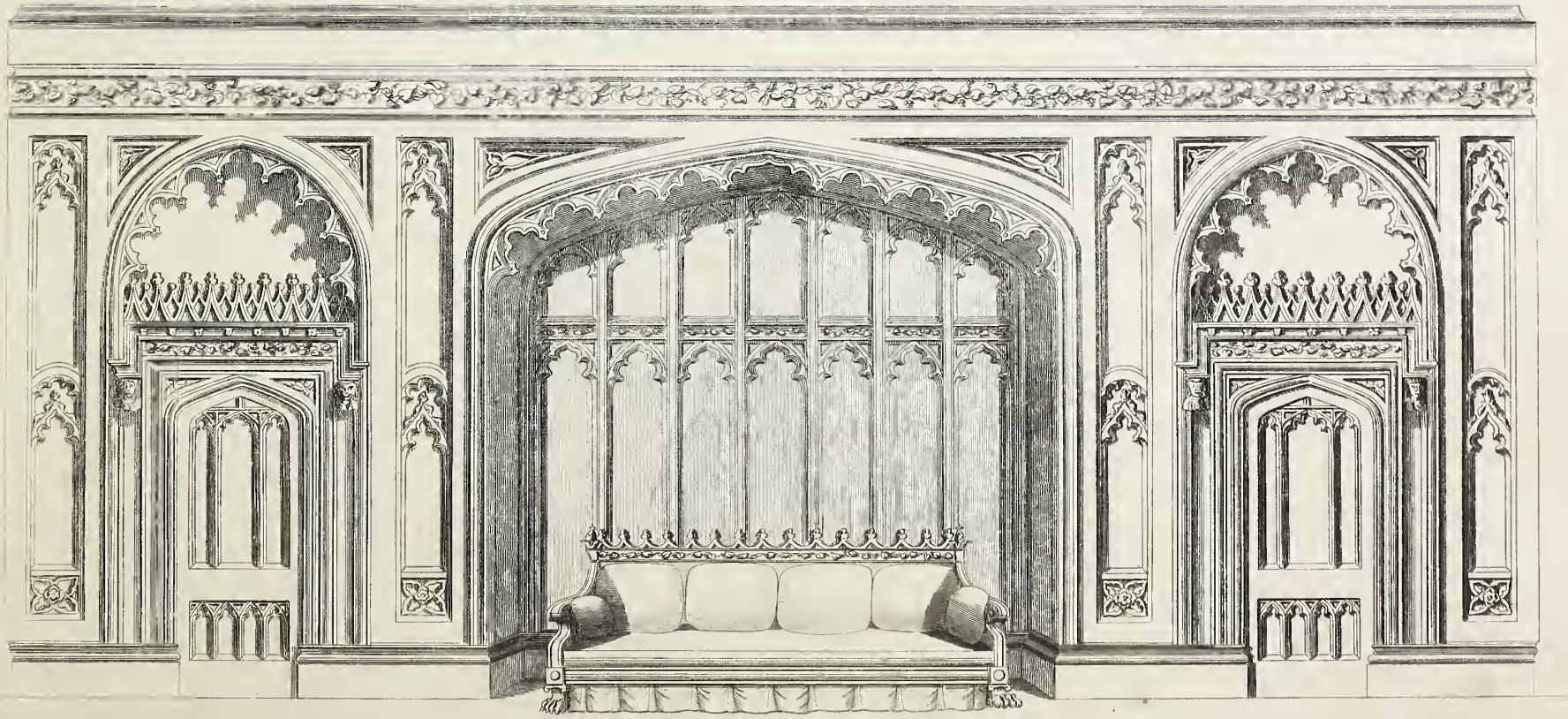
INTERIOR DECORATION.

Roman.



INTERIOR DECORATION.

Gothic.



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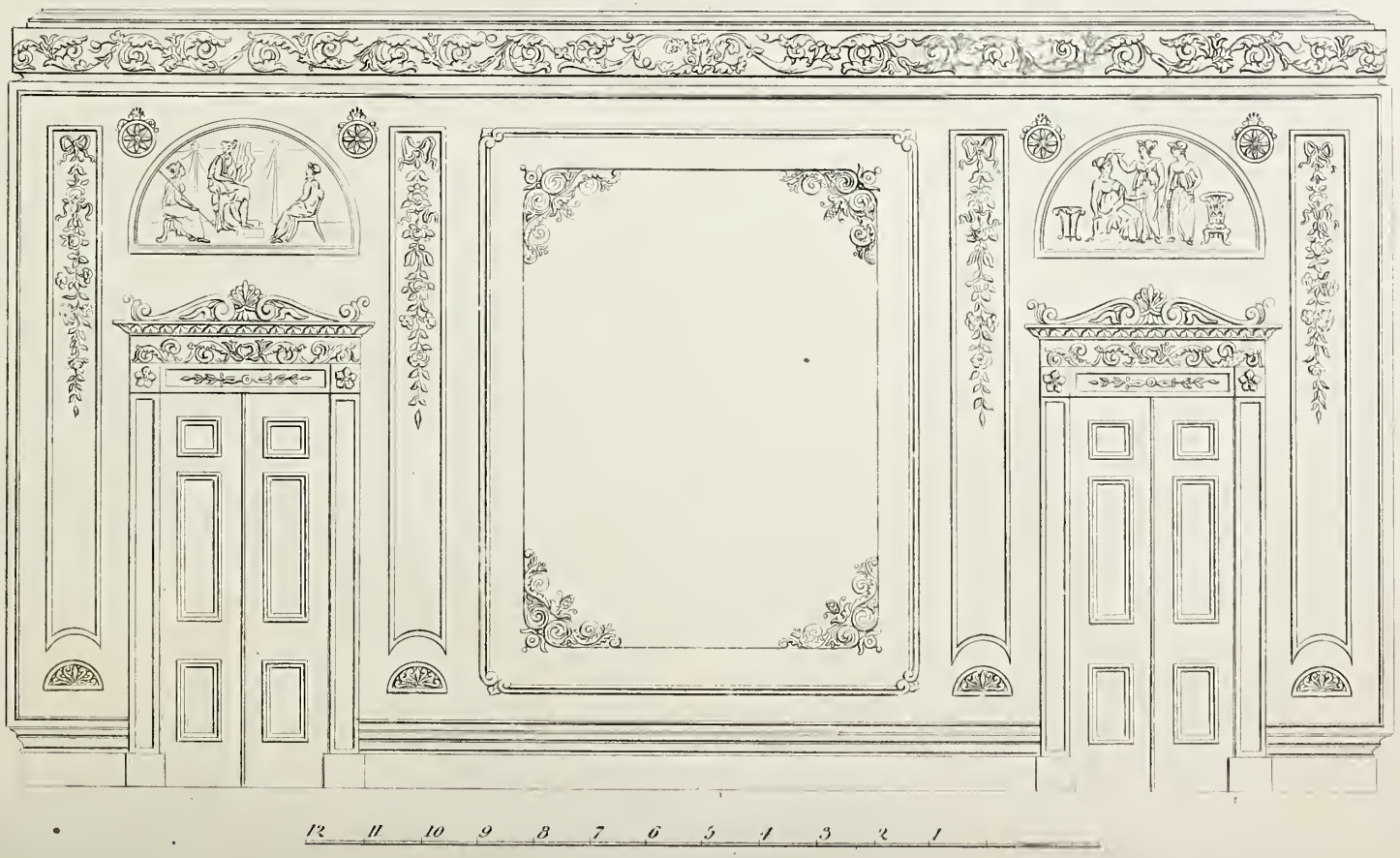
INTERIOR DECORATION, AGE OF LOUIS, XIV.

INTERIOR DECORATION.

English, 1827.



12 11 10 9 8 7 6 5 4 3 2 1

have been foremost in furnishing materials for all the inventive and ornamental decorations necessary to the embellishment of the houses of their principal nobility and gentry. These observations will render it unnecessary to go into a lengthened explanation of the plate before us; it will be sufficient to observe that the whole of the decoration in this plate is supposed to be the effect produced by the hand of the artist, and executed either in oil or distemper color, aided only by mouldings in gold where the pannel would require it. It will be easily seen by comparison, how far the one style excels the other. The age of Louis XIV. offers heaviness with grandeur; but the present style, drawn from the Greeks, although it offers only to our view a few but well chosen ornaments (putting expence out of the question), will always afford to the eye of taste a continued gratification.

HOUSEHOLD FURNITURE.

WINDOW CURTAINS.

Plate II. No. 1.

This plate contains two designs for window curtains for drawing-rooms: in both designs, the cornices supporting the drapery are intended to be carved and finished in gold. The curtains with their draperies are supposed to be made up, either in plain coloured sattin or damask, of which there are two kinds; the one being composed of silk altogether, the other being a mixture of silk and worsted; which last, although it may happen to be cheaper than the other, it will when cleaned or dyed, shrink considerably more. In addition to these there is another material greatly in use, called *Merino damask*, much of which is manufactured at Norwich, and makes up very beautifully, not requiring a lining. Drapery will ever give consequence to an apartment, and although it may for a time be in disuse from the caprice of fashion, it will always be adopted wherever a good

taste prevails; economy may render the plain vallance necessary, but it never can be introduced with a view of producing a better effect; and withal when the brass rods and large rings, &c. are added, the saving becomes very doubtful. In almost every design as applicable to domestic furniture, there arises a necessity for using a variety of colours, inasmuch as a gay and more lively effect is produced by the contrast; but if we refer to a more chaste style of colouring, and particularly so as regards curtains, it will be found in the use of one colour alone, such tint predominating throughout the whole: two other tints may be used, but the three must be of one stock, each varying from the other only by a darker or lighter gradation of the same tint. Where drabs are entirely used, a modest or quaker-like appearance will ensue, but nevertheless the general effect will be pleasing and in true taste.

Plate XXXIII. No. 4.

The observations made on the designs in the preceding plate 2, will apply likewise to the two designs exhibited in this; which being likewise intended for drawing room decoration, what becomes necessary in the one will be found equally so in the other.

Plate XXXVII. No. 6.

We have in this plate given a design for the decoration of a single window, wherein drapery has been dispensed with; the same being intended for a drawing room: as such, the materials should be of the same quality as before recommended for such rooms. The cornice is carved and gilt, and in design after the style and manner used in France during the lifetime of Louis XIV. The vallance or mantle is gathered into flutes, from each of which may be suspended a tassel. This style of curtain has something handsome and rich in its appearance; it is sometimes termed petticoat, and at other times *hammercloth* drapery, to the latter of which it carries a strong resemblance.

A vallance of this kind suits better, when used for the parlour, library, or bedchamber.

Plate CXLIV

This design is intended for the windows of a dining room, in which case we would recommend the material to be either of fine cloth, Merino damask, or of moreen.

It is obvious that with a slight addition of drapery for the pier, the present design may be well adapted for two windows, and would then form a handsome arrangement.

Plate XCV.

The style of window decoration exhibited in this plate is similar in taste to that which prevailed in England about the period when Queen Elizabeth was on the throne; the same continuing in use afterwards until superseded by a taste for drapery, first introduced into this country from France. It is a style certainly well adapted for rooms that have but little blank space or dead light above the windows, and may in such case be indiscriminately used for any apartment, changing the costly material for that which is less expensive.

The valance in this design is supposed to be of buckram covered with velvet, and ornamented with a material of the same kind, but darker colour; cut into ornamental devices at pleasure, which are afterwards to be sewed or otherwise fixed on: tassels are suspended at equal distances throughout the whole extent of the valance; behind which, a deep and rich bullion fringe is suspended from the lath.

Plate XCVI

.. design, shewing the style and manner of fitting up the curtains and drapery to a circular headed window: its enrichments will entirely depend on the apartment it is appropriated to, for this window is equally to be

found in the parlour as well as library. The valance behind the drapery is supposed to be gathered all over into puckers, such as we see used in the linings of jewel boxes, drawers, &c.; and when made with silk, produces not only a rich, but beautiful back ground for that purpose. When cantonier tails can be admitted, as in this design, a finish is then made to the window, which makes any other addition unnecessary. The taste or system of using bronzed metal or its imitation on a gold ground, is but a bad taste at best, and much on a par with the contrast of black against white.

Plate CXXIX.

The cornice in this design should be wholly in gold (that is to say, gilt,) and where carving cannot be afforded, composition may be used. To this cornice is attached what is properly termed a stone drapery, from its existing in most of the antique female statues at Rome, and forming that portion of the vestment attached to each shoulder by a button, and which falls down on the breast into folds similar to those in the present design. This design is intended for a drawing room, from the enrichment of the cornice and great depth of the drapery: but with a plain japanned or painted cornice, and less depth of drapery, the same design may be adapted for any other apartment, and its materials varied also.

Plate XII. No. 3.

A design for the curtains and drapery of a Venetian window. These windows are well adapted for the general distribution of light into all apartments. A pole cornice is introduced in this design, which may be manufactured in metal, the ends and centre ornament being carved and gilt. The observations on the articles in Plates II. and XXXIII. in regard to the materials to be used, will apply equally to this, and render further observation needless.

Plate XIX. No. 5.

In this design the two windows are furnished with a drapery in continuation over the pier; the central arrangement of the drapery being considerably raised above that of the two ends. The cornice may be of metal; the ends and centre ornaments being carved and finished in gold.

This arrangement of drapery and curtains being intended for a drawing room, the observations on Plates II., XXIII. &c., will equally answer for this.

Plate CXI.

This design exhibits a drapery adapted for two windows and a pier, to suit with that shewn in Plate XXXVIII.; the cornice in this design may be of oak, and richly carved; or it may be finished in gold. The curtains, &c., may be of rich damask, with gold trimmings, and in this case, the design would be suitable for many parts of such a palace as Windsor Castle.

Plate XI. No. 2.

Displays an arrangement for curtains and drapery for three windows, the drapery being continued over the piers. The cornices are intended to be carved and gilt, that in the centre being the highest elevated. This design being intended for a drawing room, the drapery and curtains should be made of the material before noticed in Plate II. Printed callicoes may answer extremely well for secondary apartments, or for those in houses of persons of small fortune; but they are not at all suitable for those of persons of rank and splendid income. Muslin curtains are introduced in the present design, as well as many of those preceding; they serve to break the strength of the light, without entirely secluding the cheering effect produced from the solar rays.

Plate CXLI.

This plate presents a design for a suit of curtains and drapery adapted for three windows. The drapery is arranged in continuation over the windows and two piers, the same being suspended from a pole cornice with ornamental ends richly carved and gilt, and having ornaments in the piers to suit. The drapery in this design is of an opposite colour to that of the curtains, which is frequently done for the purpose of giving a better effect in the drawing. In execution there can be but one choice, viz. that the curtains and draperies be of one colour, whatever the material may be of which they are made; nevertheless, where the quantity of silk or other material may fall short of what is requisite for the whole suit, we are not so restricted by rule as to be precluded the advantage of using two colours, whenever the same may be done with taste and judgment. This arrangement of curtains and drapery has already been executed in a light blue tabaret, with gold coloured trimmings, and a cornice similar to that of the present design; producing, in the whole, an effect that gave universal satisfaction.

Plate LXXIII.

As there have been many houses of Gothic structure erected, particularly in different parts of the country, it has been thought necessary in the present work to introduce a few specimens in that style. The design in this plate is adapted for an apartment of three windows, such being placed in a circular wall. The cornice is supposed to be of oak, in which case it will require to be wholly carved; but where expence is an objection, it may be manufactured of deal, and the ornamental parts made of composition; the whole of which may afterwards be japanned closely in imitation of oak by a skillful painter or japanner. The valance is well suited for such a style of design, where festoon drapery would become improper; and the arrangement would answer equally well for the drawing room, dining room, or library.

BEDS.

Under this article it may be requisite to make a few observations as regards the three kinds of bedsteads in general use:—1st, That of the four post bedstead, commonly so called. 2dly, The smaller four post or field bedstead; and, 3dly, That of the canopy or French bedstead. With respect to the sofa bedsteads, &c. as they are no ways introduced or noticed in the present work, a description would only tend to lengthen this article, without adding any thing interesting to the work.

In a climate so variable as that of Britain, where the transitions are so sudden from cold to heat, and from wet to dry, &c. one uniform system, both as regards dress as well as the fitting up of our apartments, has been found the most beneficial and conducive to health; and in point of comfort the old English four post bedstead with its curtains and drapery, will always be found to claim a preference before any other, although it does not follow from hence, that it is necessary to close the curtains so effectually as to exclude the free ingress and egress of fresh air;—and no form of bedstead can offer so much comfort as to warmth. In very small rooms, such bedsteads may be found objectionable, but in apartments that are not less than fifteen feet square, they are in this climate to be preferred. The advantage this kind of bedstead possesses over all others, consists in its construction, by which the curtains surrounding the whole may with facility be drawn back close to the head, leaving the front and sides open at pleasure. For general domestic use, this bedstead for the reasons above stated, stands the foremost.

2nd. The next species of bedstead which comes under the description of English furniture, is what is termed the field or tent bedstead; the teasters of which partake of various forms, and in many cases admitting of much taste and elegance in design, accompanied with lightness of effect. Formerly the curtains adapted to this kind of bedstead became in themselves too close a covering, excluding very much the free course of air; but they are now so adapted, that the curtains on each side can be

partially drawn aside to the head and foot:—in general they are never used except in small apartments. The principal bedrooms in cottages, small villas, &c. may be appropriately furnished with such beds.

3rd. A frequent intercourse of late years with our neighbours the French, has brought into general use the couch or rather canopy bedstead, over which is suspended a curtain, supported either by a single pole from the wall, or by a small teaster, otherwise termed a canopy—the same being variously ornamented. The furniture for this species of bedstead is in general thrown loosely over each end of the couch. A great degree of elegance may be pourtrayed in this kind of bedstead, inasmuch as the couch itself admits of a great display of decoration, together with the use of the finest woods in its manufacture. In state apartments as well as in large recesses in first rate rooms, this style of furniture may be used to great advantage; and in dressing rooms, nurseries, as well as in apartments where one or more beds are required, this species of bedstead and hangings in its simplest form, is in general to be recommended.

Plate V.

A design for a four post bedstead and furniture, suitable for a spacious sleeping apartment; its dimensions in width being six feet, its length seven feet, and its altitude adapted to a room of ten feet six inches in height. Although the furniture is represented by a plain tint of colour in the present design, yet the material of which it is made, may be supposed to be of a chintz pattern, lined with a plain blue, this material being most congenial to English costume. The cornices supporting the valances may be of mahogany and enriched with carved ornaments. The footboard, headboard and foot pillars together with the rails, are intended to be manufactured of the same material; the turned pillars and crowning of the foot and head boards may likewise be decorated with ornaments carved out of the solid wood.

Plate LXX.

This Plate offers a design for a four post bedstead, &c. of similar dimensions to the one before described, having its teaster covered inwardly, and surmounted by an oval dome; and the cove surmounted by a moulding, and decorated with ornaments in gold. The pillars, which may be of mahogany, are surmounted on the front and sides by three enriched carved cornices, which support a drapery consisting of nine festoons, behind which a range of drapery in plain flutes serves as a back ground, as well as for an inside valance.

The drapery and curtains may be manufactured either of silk, of chintz, or Merino damask, and the whole will then form a bedstead and hangings suitable for a state apartment.

Plate CXVII.

A design is here given for a four post bedstead with head and footboard; from the teaster of which rises three semicircular cornices, all of which may he manufactured of mahogany, together with the ornaments attached to them. This bedstead has likewise an additional teaster rising from each angle, the same terminating in a small circular block in the centre; and thus forming by the intersection of its ribs, what in architecture would be termed a groined arch. The whole effect of this design in execution would no doubt look light and airy; it is a design, suitable for the principal sleeping apartments in the mansions of our opulent gentry. The furniture, as in the article last described, may be either of silk, Merino damask, or of printed calico, and may be trimmed with fringe, tassels and rope. The circular pedestal in this design may be of mahogany: its use is for receiving une pot de chambre. On the other side of the bedstead a similar pedestal is placed, intended for une table de nuit; and both pieces of furniture may have marble slabs for their tops.

Plate CXXX.

In this design, the expence of cornice with its ornaments, &c. has been dispensed with; the whole embellishment consisting in the wreaths and shells necessary for supporting the festoons. These ornaments may either be carved, or be substituted by those cast in metal.—The furniture may be of chintz or calico, and the bedstead of mahogany. The base valance in this design may be of buckram covered with plain calico or velvet, and decorated with velvet ornaments. The inside teaster valances, are also intended to be plain and of buckram, covered with calico after the same manner and to suit in shape the base valance, but ornamented with tassels &c. as fancy may dictate.

Plate XLIII.

This Plate contains five various designs for the foot pillars of bedsteads; in height they are rather more than 9 feet. Three of the patterns would require a scantling of mahogany, 6 ½ inches square, the other two requiring a scantling of only 5 ½ inches; all these pillars are alone fitted for first rate bedsteads, and should be supported on French casters. It will be necessary that the wood should be carefully selected both as to quality and soundness, and the carving put into competent hands—the plain surfaces on the pedestals of the three first designs may be overlaid with veneers of a choice figure.

Plate XCVII.

The field, or as they are sometimes termed tent bedsteads, are so much in common use as to render a description of them almost unnecessary; we shall therefore confine what we have to say in a small compass.

The design offered in the present Plate, and which is intended for an apartment of a superior kind where a display of show and dress becomes necessary, is more peculiarly calculated for the smaller apartment on the principal floor of a mansion. The ornamental cornices supporting the drapery, may be executed in composition and japanned in colours to suit the pattern of the furniture, where expence is considered an object. In regard to the furniture, what has already been observed on the designs in the previous plates, will likewise answer for the one before us. This description of bedstead is generally intended for the use of single persons, but will very well supply the place of a four post bedstead in the principal sleeping apartment of the small villa or cottage orné.

Plate CXIII.

A design is here given for a field bedstead and furniture, of a more simple construction than that last described; expence being altogether avoided in this composition, so far as relates to a bed somewhat above that in common use:—in an object so familiar, it would be needless to enter further on its description.—The more ornamental style of French bed will therefore close what we have to say on this article of domestic comfort, and first with that numbered

Plate XIII.

This description of bedstead and furniture, with its decorations, &c. is of foreign invention, and goes back to a period of very early date;—it is nothing more than a refinement on the humble bed of our ancestors, and its use is more prevalent in France and over the continent, than in this country. The frame of the bedstead in the present design is supposed to be manufactured of the finest mahogany and highly polished, and finished with *Or molu* ornaments, when required. The curtain covering the whole at night, is suspended by a pole from the wall above, and again by poles placed over

each end of the couch, so as to keep the curtains a sufficient distance from the party when sleeping; as shewn in the plan below. The details given in the plate, render further description unnecessary, we shall therefore pass on to

Plate LX.

Which exhibits a design for the same species of bedstead and hangings, in its more expensive style. The dome or canopy, as an appendage to this bedstead, forms a principal feature; and the whole thus arranged, is suitable for the principal or state apartment in the mansion of the nobleman or gentleman of fortune. The richest materials will of course be requisite to be used for such an article of elegance; such as silk for the furniture, and the finest woods for the bedstead.

CHAIRS, SOFAS, &c

There is scarcely any article in the whole range of the Upholstery branch, that admits of more variety in taste and design, than that of chairs and sofas. From the earliest periods of human civilization, and amongst various nations, they have been in use as an article of furniture. In the hieroglyphic paintings which have been discovered in the tombs of the kings, at Thebes in Egypt, representations may be seen of different superb ornamented elbow chairs, and the same of couches; and designs drawn from these remains, and given by the Author in a former work, have been successfully manufactured at various periods. But for simplicity of form, beauty of outline, and delicacy as to substance, no chairs can be said to surpass those of the antient Greeks, and which they could only have effected by the use of metal. The best specimen of chair after this taste was one, designed some years back for furnishing of the drawing rooms of Henry Baring, Esq., and manufactured for him by the Author. A similar style of chair may likewise

be seen in the drawing rooms at the house of Alexander Copeland, Esq., in Great George Street, Westminster; manufactured some years since by Messrs. Oakley and Evans. With respect to the style and fashion displayed in this article of furniture in England, and especially that of the present day, much cannot be said by way of praise or encomium; the patterns which have lately been produced, offering in themselves rather a melange or mixture of all the different styles associated together:—for instance, it is not uncommon to find a parlour chair made with turned front feet, the back feet of which will be strictly Grecian, and the yoke for the back partaking of the same style, but supported by Roman columns. The necessity for economy urged by many at the present day, is in itself sufficient to check and weaken the spirit for design, and thus we see nothing but a monotony of character in this article of furniture. In some few instances we witness a lavish of expence displayed in the production of the furniture, designed in the style and after the manner of that which prevailed in the age of Louis XIV. of France; an example of which is given in Plate CXLVI. (see the design marked *French*): here we have magnificence, but not taste; an elaborate display of ornament, but no beauty in general outline—those who possess a strength of fancy for this species or style of furnishing, may have his, or their taste amply gratified by a visit to Crockford's Gambling-house in St. James's Street, which is wholly furnished after this manner. We now proceed with our descriptive catalogue of the chairs, contained in the present collection of designs, beginning with

Plate III.

The two designs contained in this Plate are wholly fanciful; the one on the left hand being after that of the French school, and the other partly Grecian. They are both intended for furnishing the drawing room, the frames being manufactured in rosewood, with the ornamental parts finished in gold. The backs in both the designs are fitted with loose frames, which may be stuffed and covered with the same material as the seat; a stuffed back will at all times give a consequence to the appearance of the chair, and at the same time adds to its comfort.

Plate CXLVI.

Contains two designs for antique chairs; the first being a French pattern, and after the taste of the age of Louis XIV. Of this design we have already spoken and made reference, which will render any additional observations unnecessary; further than it is intended for the same apartment as those described in the preceding Plate, and should be wholly of rosewood, or altogether gilt. The other design is copied from an original chair brought over from India and executed in ivory, being now in the possession of Sir George Talbot.—The whole of the ornament is exquisitely carved, and beautifully finished. This design is given to show the variation of style as regards the taste of different countries:—It is a chair not altogether adapted for ease on account of its form, nevertheless there is a considerable display of merit in the original composition.

Plate CXLIII.

In this plate are two designs for chairs, after the style of the florid Gothic; they are intended to be executed in oak, which at all times is the most suitable material for this style of work. Gothic furniture should never be introduced but where the architectural style of the building is after the same taste:—In all other instances its adoption becomes an anomaly.

Plate LXVIII.

Two designs are here given for fauteuil or lounging chairs, intended either for the drawing room, the dining parlor, or library; their covering varying according to the apartment they are destined for. This description of chair has its frame of mahogany or rosewood;—of mahogany when it is destined for the parlour or library, and of rosewood when appropriated for the drawing room. These chairs are calculated for indulgence, being adapted chiefly for the luxury of the wealthy, and comfort of the infirm.

Plate XXXII.

Contains two designs for hall chairs; the one on the left hand of the Plate, to be executed in oak, and that on the right hand in mahogany. Further observation on articles of such common usage would be needless in this place, the parts being plain by inspection.

Plate CXIX.

The two first designs, intended as patterns for the backs of chairs, and appropriated for the dining room, have the Grecian outline for their back, finishing with a broad and hollow yoke. Both the backs are intended for stuffing, and covering with leather.

The two designs underneath are intended as patterns for the backs of drawing room chairs, to be executed wholly in rosewood as before stated. The first design partakes of the Grecian style, the central part being stuffed, the frame enriched with carving, and the yoke ornamented to suit. The last design may properly be styled English, and is wholly fanciful as to the arrangement of its parts.

Plate XXXVIII.

This design for a sofa is intended for the library; the frame to be manufactured wholly of mahogany, and the ornamental parts carved out of the solid wood:—the back cushions, together with the two bolsters, pillows, and seat cushion, to be covered with green morocco leather. The ends of this sofa partake of the Dolphin form for their outline, the whole of which figure is made out into carved foliage ornament. The graceful outline which this figure offers, has occasioned its introduction for this article of domestic use.

Plate CXXXVII.

A design for a sofa, intended for the drawing room; the frame to be executed in rosewood, and all the enrichments carved out of the solid. The covering for the seat, the back cushions, bolsters, &c. may be made up out of printed colico, Merino damask, or silk, as occasion may require.

Plate LXXXI.

Two different designs for tête à tête seats. In France this description of seat is very common as an article of indulgence; it takes its name from its being intended for the accommodation of two persons. This article of furniture is very useful in small apartments, where the recesses on each side of the chimney breast are generally too contracted in width, to admit either sofa or chaise longue. As to their material, their decoration, and covering, it will be the same as that of the sofas in the room for which they are intended to be placed.

Plate XCIV.

The first design in this plate represents a seat commonly termed a *Chancelier*, from the resemblance it bears to the seat or cushion on which the Chancellor of England is seated in the House of Lords, which in its original form is made to imitate a wool sack. The present design in some measure differs from it, inasmuch as a bolster is made to run down the whole length of the middle, having cushions or pillows resting on each side. This description of seat is appropriated for occupying the central situation of spacious apartments, and should be covered en suite with the curtains, sofas, and chairs in the room. The second design represents an ottoman, which is a species of seat generally without ends or back; but in this figure a deviation is made. The ottoman here given, is intended for occupying the left hand side of a chimney breast, having a framed

upright back to receive the cushions which are placed against it. Being placed in a recess, the cushion at one end is supported by the wall, and the cushion at the other end, by the projecting breast of the chimney. The covering &c. should be regulated as described in the preceding articles :—for the rest, reference may be made to the plan underneath.

Plate X.

Exhibits two designs for chaise longues, both of which are adapted either for the drawing room, dining parlour, or the library at pleasure; the covering being suited to the apartment for which they are designed. If intended for the dining room or library, the covering may be of morocco leather, and the frames mahogany; if used for the drawing room, the frames should then be manufactured of rosewood, and the materials intended for the covering, to accord with and be the same as that of the window curtains.

Plate CXXXVI.

This elegant chaise longue as to its design, may be considered as wholly Grecian, and is best adapted for the drawing room, or boudoir; in which case, the frame may be wholly of rosewood, and the seat and ends covered either with silk, Merino damask, or linen. If appropriated for the state apartment, the frame might then be finished entirely in gold.

Plate IX.

Six designs are given in this plate for patterns for chair legs, shewing a part of the seat rail to each. These legs being much enriched with carved work, are best suited for drawing room chairs; and in that case, they should be wrought entirely in rosewood, or have some of their

parts in gold. This plate also contains four various patterns for the supporting feet of sofas and chaise longues, shewing part of the foot rail, and scroll end of each.

What has been said in respect to the chair feet, will also apply to these as regards their designation.

Plate CIV.

This Plate contains four different ideas for the scroll ends of sofas, shewing the profile of one end, part of the rail, and one leg, in each design. Agreeable to the fashion of the present day, the frames would require to be made of rosewood, and the carved ornaments to be worked out of the solid; but we are not prevented from making use of a mixture of gilding whenever the other finishings of an apartment may require it.

Plate LXXIV.

Three designs are here given for music stools; one shewing its frame as worked in mahogany, and the other two as executed in rosewood, with their ornamental parts in gold, the covering of each seat being of morocco leather:—underneath each design is given a plan of its pillar and block, with a scale.

Plate CXXXI.

This Plate contains six different designs for foot stools in profile, intended as appendages to the furniture of the drawing room. They are variously got up and ornamented; some being manufactured of rosewood, some altogether finished in gold, and others partly in rosewood with gold ornaments. The covering for this article must be regulated by the rest of the furniture in the apartment.

CABINET FURNITURE.

There are no people of any country whatever tnat excel the English in the manufacture, the construction, or taste in design as regards the article of cabinet furniture in general; all of which is distinguished by a lightness, and a fitness for the purpose intended; accompanied by a delicacy and neatness of finish, peculiar to the British artizan, that no where has its equal. We do not by this encomium on our own countrymen, mean to debar our neighbours or competitors of their share of merit. The artizans of France are ingenious in their invention, but are rarely to be distinguished for their care in construction:—no people are more ready at contrivance, but withal they have not patience to avoid clumsiness in their finishing. In almost all their designs for furniture there reigns throughout a heaviness, arising in a great measure from their aiming too much at architectural character; than which, as it is applied to furniture, nothing can be in worse taste or keeping:—It gives to their wardrobes, escrutoires, bookcases, &c. more the appearance of ponderous masses of wood; and in many instances renders them unsightly as articles of taste. If however, they are deficient in point of taste in design as regards their larger articles of domestic furniture, they amply excel in those of the smaller kind; for in whatever relates to articles for feminine use, such as their work-tables, writing-tables, chiffoniers, dejuné-tables, trick-track tables, dressing-tables, and many other meubles of the same kind,—all these possess an elegance and taste in their design, as well as a great degree of beauty in the ornamental decoration of their parts, to which they as pieces of furniture are chiefly indebted for that pleasing effect prevailing in them; such ornaments being the production and design of perhaps a first rate artist: and the execution as to the modelling, casting and finishing in metal, being equally excellent.

In this place we must not omit to mention another race of artizans; viz. the Germans, as being ingenious in almost every branch of mechanical art placed under their hands:—they possess the grand essential

towards producing good work, viz. that of patience, if they are not altogether so quick and fanciful as the French on that which relates to design. Some years back many of these artizans worked in several of our cabinet manufactories, but have since emigrated almost all of them into the musical establishments of Messrs. Broadwoods, Muzio Clementi, Stodart and others.

If we refer to the artists who have excelled in their designs for furniture we shall find but few to notice amongst our own countrymen. Mr. Thomas Hope stands the foremost on the list, as being best acquainted from his travels, with the costume of foreign countries, and as possessing a very refined and classic taste. Mr. Thomas Chippendale (lately deceased), and known only amongst a few, possessed a very great degree of taste, with great ability as a draughtsman and designer. Except a few secondary assistants in this branch of design, we have now none of any consequence; unless we take into the account some few of our best architects, whose efforts at best can be but limited, arising chiefly from a want of knowledge as to the proportion and distribution of the component parts of cabinet furniture: and which alone can only rest in the individual who is well acquainted with the practical part of the whole.

If we refer on the other hand to foreigners resident in this country, we may reckon at the head of this department Mons. Boileau, who was formerly employed in the decoration of Carlton Palace. This gentleman, in addition to his unrivalled taste in decorative painting, possesses a light, an airy, and classic style of design for household articles of comfort; and he has never been surpassed by any modern artist in his designs for ornamental plate or articles for casting in *Or molu*. The late Mr. Bogaert, in addition to his merits as a carver, was also equally happy in his designs for furniture and other branches of interior decoration. There are other artists, as well foreigners as English, of considerable merit, who practice in the decorative branches of design; but as they are no way connected with the manufacturing department, nor with that of making designs for furniture, we shall avoid enlarging any further on the subject, and pass on to the descriptive portion relating to cabinet furniture,—the last series in this our work.

TABLES.

Plates XXIV. and CXVIII.

These two plates exhibit three different designs for occasional or sofa tables, intended as meubles for the drawing room; in which case they may be executed wholly in fine rosewood, or they may have a portion of their ornamental work in gilding or *Or molu.* If intended for the library or dining room they should be manufactured of mahogany, and the ornamental parts carved in the solid wood. In plate XXIV. each design is accompanied with a profile of its standard, the parts of which may be measured by the scale given; and in plate CXVIII. is given one half the plan of the table.

Plate XLII.

In this Plate are given two designs for loo tables, intended for drawing rooms, as being much enriched with carved work; and which may be manufactured either of solid rosewood, king wood, or of other fancy woods of equal beauty. If intended for the dining room or library, this species of table should be manufactured wholly of mahogany with a lesser portion of carved work. A plan of each block on a reduced scale, is given at the bottom of the plate.

Plates XXVII. and LXIV.

The designs given in these two Plates are intended as tables for occupying the piers between the windows of the drawing room, and in these cases should have mirrors placed over them. The lower design in Plate XXVII. is represented as having its sides inclosed, the panels of which on

the outside are intended to be filled up with quilled silk; and those on the inside as well as the back, with silvered glass. The intent of this arrangement is to produce a reflecting effect from the china objects of ornament which are usually placed in such situations.

In Plate LXIV. is given a design for a console table, with a portion of the glass frame shewn over it, after the style of Louis XIV., accompanied with a geometrical profile and a scale.

Plate LXXXIII.

The first subject in this plate is intended for the use of female artists, as well as to answer the purpose of a pier table. When used in drawing rooms, this table may be so adapted, as with a rising frame at the back to admit the influence of heat from the fire place, and at the same time afford a riser for the female artist to place her copy on:—the small drawers on the right and left hand of the table, are intended to contain all the apparatus and materials necessary for drawing, and that in the centre for the reception of drawing paper. The second subject in this plate exhibits a design for a writing table with a sliding screen at the back, which may be raised up or lowered at pleasure, and should be filled with plate glass.

Plate VIII.

Contains two designs for ladies' work tables, which may be either of rosewood, fine mahogany, or of any other fancy woods. The table in the second design is furnished with a backgammon board, and a sliding cover, divided either for draughts or chess. A profile and plan is given with each table.

Plate XXVI.

In this Plate are given two designs for articles of Cabinet furniture, both of them adapted for occupying the boudoir :—they may be considered of French origin. The first design contains a secretaire drawer, adapted to the height for writing, together with a sliding frame intended as a desk, under which is an open space for paper, &c. The upper desk is so proportioned in its height, as to be equal to the position requisite for a person to write or read when standing ; it has sliders right and left of it, for holding candles or other articles.

The second design forms an ornamental table, either for the boudoir or drawing room :—the tops of such tables are generally of the finest Parian marble ; sometimes they are composed of a mixture of scarce and valuable stones inlaid and cemented together, and in this case are termed tesselated. Where such table tops are known to be genuine, they are almost invaluable; but the craft and artifice of dealers in this article too frequently impose on our faith, by substitution.

Plate XXXVI.

The first design in this Plate is that of a dressing table, having the central portion of the top occupied by the wash-hand bason; on each side of which and under hinged covers are contained the water caraffs, the tumblers, tooth brush trays, &c., as shewn in the plan :—one of these sides is fitted up with two trays, the one over the other, which are intended to contain combs and other small articles, necessary in dressing. The dressing glass is intended as a fixture at the back, after the manner of those in the French toilette tables :—these tables may be manufactured either in mahogany or rosewood. The second design exhibits a toilette table, wholly intended for dressing ; it contains three drawers which are fitted up with various divisions for combs, brushes, and various other articles necessary for the toilette : this table, like the one preceding, has its dressing glass fixed to the back, and may be manufactured of woods of the same description.

Plate LIX.

This design is intended as a double wash-hand table, and is wholly after the French taste. The top containing the basons, &c. is intended to be of marble, and the frame under it to be made of the finest figured mahogany, which in the inside is lined throughout with lead. This table is supported by four truss shaped legs, resting on a plinth; the ornamental parts of which may be of metal, either lacquered or gilt: a plan and scale is added, by which the parts may be measured.

Plate CXXVI.

The design in this Plate is intended as a dressing table for the principal bedchamber, and should be manufactured of the finest wood:—the drawer under the top is wholly fitted up to contain the necessary dressing apparatus, with watches, trinkets, and other bijoux appertaining to female use. The drawers above are intended for the reception of papers and other articles, over which is fixed the dressing glass. This plate likewise contains a design for a circular wash-hand stand, accompanied with a plan.

Plate CXXXII.

Contains two highly ornamental stands for the reception of hand-basons and ewers, and other articles necessary for daily lavations. This article of furniture may either be made of mahogany or rosewood; if of the latter, the whole of the ornamental parts may be executed of metal, such as the masks and tails of the Dolphins with the shell ornaments supporting the base; as well as the gallery round the centre shelf, and the rings attached to the swans heads. The same may be said as to the ornamental parts in the design for the larger stand, such as the ornaments round the frieze, the foliage on the truss supports, the paw feet, &c.

Plate CXXXIX.

Two designs for tripod stands for flower baskets. These stands being intended for the drawing room, should be of the finest mahogany or rosewood, with their ornamental parts in metal gilt, or in wood carved and gilt. In economical cases they may be manufactured in common wood, and japanned. A plan is given with each scale, by which the parts may be measured.

Plate XXXV.

Two designs for card tables with pillar and claw supports; which when much enriched as in those before us, should be made of rosewood, having some parts finished in gilding:—the tops are best when lined with velvet instead of cloth. The advantage in the construction of these tables consists chiefly in the top turning round upon the frame, in which case it then answers as a kind of loo table.

Plate CIX.

A design for a hall table. This description of table in general is very plain in its design, when adapted for the common hall or entrance to most houses; but we here give a design for a table, answerable for the hall of the nobleman's mansion: it will be sufficient to say that the material used in its construction should be mahogany, and whatever constitutes ornament about it, should be carved out of the same wood. In some cases a drawer may be added for containing cards of address, the Court Guide and other books, which the hall porter may have occasion for.

Plate XCIX.

A design for a sideboard table : this description of sideboard is adapted for a dining room in a moderate sized house, where room would be wanted for separate pedestals and the space necessary between them and the side table. This sideboard may likewise be used on an enlarged scale where pedestals are not required ; the use of which is substituted by a sarcophagus cellaret being placed under the centre. The whole design is made plain to the workman by the addition of the plan, profile, and scale of feet.

Plate IV.

In this plate is given a design for a sideboard and cellaret, with circular pedestals at each end detached ; their use being explained by the plan below, in which will be found letters of reference to each part. It is to be observed that such a sideboard with its pedestals will require a space of at least 14 feet, and therefore no way adapted for small houses.

Plate LXXV.

Exhibits a design for a pedestal sideboard ; the one side adapted for a cellaret or store for wine ; the other being fitted up with racks and a heater, and lined throughout with tin, for the purpose of keeping the plates warm during the time of dining. Under the centre is placed an oval open cistern lined with lead inside, intended for holding the ale and beer jugs, as well as to contain the ice for cooling the wine in hot weather.

Plate LXVI.

Two designs for pedestals to stand detached from the sideboard :—they are here given geometrically, and therefore may be measured by the scale. These pedestals may be fitted up for the same purposes as those described in Plate LXXV.

Plate LXIII.

Exhibits four designs for the backs of sideboards, to be placed on the level surface of the top against the wall; answering for an ornament as well as a guard. They form a substitute for brass rods, the panels sometimes being fitted up with looking glass, as noted in these designs.

Plate XVII.

This Plate contains six various designs for legs, as supports for sideboards. The four first are intended to be turned; the two last to be shaped and carved, as shewn by the profile and front view of each design.

Plate XXIX.

The two designs in this Plate are denominated running sideboards and sometimes vulgarly termed dinner waggons. Their use is for the purpose of bringing the dinner at once from the hall into the dining room at one opening of the door; and likewise for receiving and carrying away such dishes and plates as have been used. In small families, they answer the purpose of a dumb waiter when the attendance of a footman is not required. The profile and scale given with each design, will render their construction plain to the workman.

Plate LV.

These articles of furniture which belong to the dining parlour should be executed in mahogany, and the ornamental parts carved out of the solid. The insides are lined with lead to receive the beer and ale jugs; or at other

times to ice the wine intended for use after dining. A plan of each is given, by which it will be seen that there is sufficient space in each cooler for ten decanters or bottles.

Plate CVII.

Contains two designs for cellarets or stores for wine, to be placed underneath the sideboard. This article is so familiar as to render description almost needless:—it will be sufficient to observe, that they appear to most advantage when manufactured wholly of mahogany; as well the ornaments as the body itself. By the plans given with each, it will be seen how much the square plan has the advantage over that which is shaped in point of accommodation; the one containing twelve decanters, whereas the other will only contain eight. The spaces noted *a, a, a, a,* in the first plan are intended for the reception of bottles, placed horizontally; and the two spaces in the second plan are likewise for the same purpose.

Plate LXXX.

Exhibits a design for a lady's secretaire, having shiffonier on the top, with silvered plate glass at the back. The lower part is inclosed by doors, the panels of which are fitted up with an ornamental metal guard and covered behind with silk, which may either be plain as in the present design, or otherwise gathered into neat plaits. The decorative enrichments in this article of furniture should be executed in *or molu,* and the case itself, of rosewood or fine mahogany as fancy may dictate. The secretaire drawer is fitted up as usual for the purpose of writing. The plan shews the situation of the columns; the profile giving the heights, the projection of the mouldings, &c.

Plate VI.

This elegant piece of drawing room furniture is intended for the end of an apartment, to be placed opposite the chimney piece; or in

some cases it may be placed between two doors. The inclosed ends are generally appropriated for the reception of music books, &c.:—sometimes the tops are made of valuable marbles, or otherwise of their imitation called scagliola.

Plate CII.

This Plate shews two designs for drawing room commodes, intended for filling up the piers between the windows of a drawing room; the doors of each commode have an ornamental brass guard fixed before the silk. A profile is given with each design as a guide to the workman in measuring the parts.

Plate LXIX.

Contains a design for a commode in the Gothic style, to be manufactured of rosewood when intended for the drawing room; in which case the open space in the centre may be appropriated for the reception of ornamental China jars, and be filled up with plate glass at the back. When appropriated for the library, this piece of furniture may be made of mahogany, and the centre space in that case, be destined for receiving the terrestial and celestial globes.

Plate LXXII.

In this plate are given eight various patterns for the supporting feet of cabinets or commodes;—the design marked A, A, being shewn in profile as well as in front. The last three designs are intended as supports for foot-stools.

Plate LXI

Exhibits two designs for dressing room commodes after the French taste. The drawer over the truss supports in the first design is sometimes

fitted up for writing; and at other times fitted up to contain the whole of the apparatus necessary for dressing:—the other drawers are intended for linen. The second design being considerably higher, is intended both for clothes and linen. The frieze is made to draw out, and forms a depository for jewellery, papers, &c.

Plate XC.

In houses of first rate dimensions, the best apartments of which are generally very spacious, and thereby capable of admitting furniture on an enlarged scale, an opportunity is afforded for giving a design out of the common routine. The present plate exhibits a design for a wardrobe adapted for an apartment of such ample dimensions; affording much convenience as regards accommodation for an extensive assortment of clothing, as well as producing considerable effect from the distribution and proportion of its parts, which in such pieces of bedchamber furniture is generally very heavy. The central division of the present design is wholly intended for sliding tray shelves;—the parts connecting the centre with the ends, are fitted up with drawers, and the two outside wings are intended for the purpose of hanging up dresses that would otherwise be injured if folded together. The heights in this design may be taken geometrically from the front elevation; the perspective making little variation, and certainly none but what the intelligent workman can make allowance for:—the plan and scale will guide him as to the proportions.

Plate XXXI.

With respect to the design in this Plate we have only to observe that the ends are intended for the same purpose as those in the one preceding, for receiving the habilliments *de nuit*. The proportions may be obtained from the elevation and scale as before mentioned

Plate CVIII.

This design for a lady's dwarf wardrobe is of similar dimensions to that in the preceding Plate, but is different as to the arrangement of the parts. The central part being screened by folding doors, is intended to be fitted up inside with sliding shelves up to one half its height, and the other half to be occupied by drawers. The two wings are intended for hanging up dresses, as before stated

Plate CI.

The two designs in this plate are for box dressing glasses, so termed as having a case placed beneath the glass, which is generally occupied by three drawers. They are for the most part manufactured of mahogany; and are intended for first-rate apartments, when executed of rosewood:—the profiles in this plate will be sufficient to give the geometrical heights and projections.

Plate XV.

The placing a glass over the chimney piece will always hold the preference to the fixing of this mirror in any other situation in the room. The walls of our apartments on the chimney side cannot be said to be properly furnished without the addition of a glass; for pictures make but an indifferent substitute. There reigns throughout a cheerfulness, a gaiety, and what the French would term a *Je ne scais quoi,* in regard to the effect of a glass, as to induce us to consider the apartment as lifeless that does not contain it. We have in this plate given two designs for this elegant and pleasing article of domestic embellishment with a section of each frame, and the mouldings, on an enlarged scale. With respect to the style and manner of their

execution we shall forbear saying any thing, further than when executed wholly in gold, the general effect will not only be the most chaste, but also the most imposing in its appearance.

Plate LXI.

Drawing room fire screens. Two designs are here given for this useful and elegant appendage to the furniture of the drawing-room. In the first design, as much variety has been displayed in the form of the mount as such would consistently admit of. In the second, the idea of the banner has been adopted, with the addition of a Grecian ornament as a finish for the upper part, from which is suspended silk tassels and line. The standards in both designs may be executed either of mahogany, rosewood, king-wood, or of zebra-wood; and the ornamental parts finished in gilding:—or they may be carved out of the solid wood.

Plate CXXXVIII.

Screen libraire. In the nobleman or gentleman's library, the bookcase screen will not only be found a useful appendage, but at the same time will form a portable and ornamental library of itself. The idea as given in this design was suggested from the use that a portable bookcase would be in the library or drawing room, the want of which hitherto has been supplied by the open chiffonier. Here we have an article of furniture serving the purpose of a screen in cold weather, the front of which when elevated or sliden up, discloses a small but select library. The panel of the rising front may be filled either with silk, as shown in the plate, or it may be fitted with transparent plate glass, shewing the books when down; and although we have in this instance an elevated screen securing us from the heat when raised up; yet we are not altogether shut out from a view of the cheering fire. This elegant piece of furniture may be constructed of any of our fancy woods, according to the apartment it may be destined for.

Plate XXIII.

This plate offers a design for a library bookcase, a piece of furniture familiar to almost every one. In the present design, columns are introduced in the lower part after the French taste; and the panelling of the under doors is varied from the usual manner:—various patterns for dividing the glazed doors in the upper part are also given. The ornamental parts, such as the caps of the columns, the corners of the door panels, &c., are given on an enlarged scale; a correct plan, with a scale for the same, and likewise a scale for the enlarged parts, being added:—the mechanic will therefore find no difficulty in the construction of this very useful article of furniture.

Plate XLI.

This design is intended to occupy a principal situation in the spacious library or study. In the composition of this ornamental piece of furniture, the Grecian style has been adopted; and at the same time, every attention been bestowed in its construction, to render it as a whole, and in all its parts, useful as well as elegant. The whole of the ornamental embellishments are given on an enlarged scale in so ample a manner, together with a plan of the bookcase; and a scale as well for the elevation as for the enlarged parts, as to render further observation unnecessary, the whole being plain by inspection.

Plate XCVIII.

A design is here offered for a dwarf bookcase, divided into four equal parts, each being inclosed by a single door; having the panels filled with trellis wire work, which may be either backed with silk or not at pleasure. The ornamental parts, such as the busts, and the foliage cups forming the supports for the pilasters, may be of bronzed metal. This description of

bookcase has now been brought into general use;—it affords an opportunity for placing antique vases, or pieces of curious ornamental china on its top, leaving an ample space on the wall above for the placing of pictures. All the dimensions in regard to height may be obtained from the elevation, the front being nearly geometrical; and the plan will give all the required projections.

Plate CXLII.

A design for a dwarf bookcase, intended to occupy the entire blank space which the walls of a library may offer; whether between two doors or any other side of the apartment. The style of this bookcase may properly be termed Roman; and those who are best acquainted with the antiquities of Italy, will at once see from whence the composition has been drawn. The central part with the wings, is represented as having the doors filled with silk, the intention of which is to afford more variety, and in some measure give repose to the eye, which is oftentimes little studied in the arrangement of extensive libraries; for nothing can distress the eye more than the sight of a countless number of volumes occupying one entire space. What we have before observed in the preceding article as to the placing of vases, &c. on its top, will also apply to this, and render it unnecessary to add any thing further.

Plate XCIII.

This Plate contains six various designs for fitting up the panels of bookcase doors. The three designs in the upper portion of the plate represent only one half the height of each door:—the parts may be measured by the scale given.

Plate XVIII.

The candelabra in this Plate are intended for drawing rooms of first rate dimensions, and may be executed after two manners :—the one wholly in carving; the other by the use of composition. They may be finished either wholly in gilding, or otherwise with a mixture of bronze.

Plate CXV.

Contains two additional designs for candelabra, on a scale of greater magnificence than the preceding, and adapted only for state apartments. In other respects, the manufacture of these ornamental articles of furniture, as regards their finishing, will be the same as those last described.

Plate CXXXIV.

In this Plate are given four different designs for candelabra of smaller dimensions, intended to be placed on dwarf bookcases, commodes, or pier tables; and sometimes on *encoignures* or angular commodes, meubles which are very much used by the French in the angular corners of their apartments. They may be finished after the same manner as the preceding.

Plate XXII.

In the larger dwellings of our nobility and gentry, and likewise in the apartments of individuals of smaller fortune, the Jardiniere has always been considered an essential article of furniture, as containing, whether in summer or winter, all the varieties and endless beauties of *Flora*. In France, this species of interior furnishing is carried to a very extravagant extent as far as materials and decoration will allow. We have contented ourselves

with supposing the body, the supporting columns and plinths in the present design, to be executed wholly of mahogany, with no other embellishment than merely the fineness of the wood and the beauty of its polish, the caps and bases of the columns being cast in metal and gilt. The upper basket may be of wire work painted. The body of the Jardiniere is lined inside with lead, having a socket and plug to let off the water which may accumulate from refreshing the plants. The aviary may have its ornamental supports and its cornice of bronzed metal, the spaces between which and the dome above being filled with wire work, the whole standing upon a marble plinth, on which is placed a marble vase containing water for the warbling inhabitants in their wiery castle.

Plate LXVII.

On the left of the plate are three designs for cornice centres, from which the drapery would be suspended and pass off right and left, and again be suspended by ornamental ends, such as those shewn on the right hand of the plate. These ornamental embellishments to the window curtains are mostly carved and finished in gilding; sometimes brass or composition is substituted, for the sake of economy.

Plate XCII.

The first design in this plate exhibits a cornice, adapted for the window of a house furnished after the Gothic style, the manner in which it is cabled, fluted and ornamented with beads, being of Saxon invention; this cornice with its ends, &c. will appear best when executed in oak.

The two last designs should be wholly carved and gilt, to produce a good effect, although in some cases composition may be resorted to, where the expence of carving would otherwise prevent the adoption of the design.

Plate CXXXV.

Three designs with their profiles are here given for ornamental brackets, intended as supports from the wall for glass lustres or girandoles; they are likewise used for carrying ornamental china, antique vases, for metal or plaister figures holding lights, and lastly for supporting ornamental French clocks. Their material and manufacture will be varied according to their use; some being executed in mahogany or rosewood, some carved and gilt, and some executed in plaister and finished as bronze.

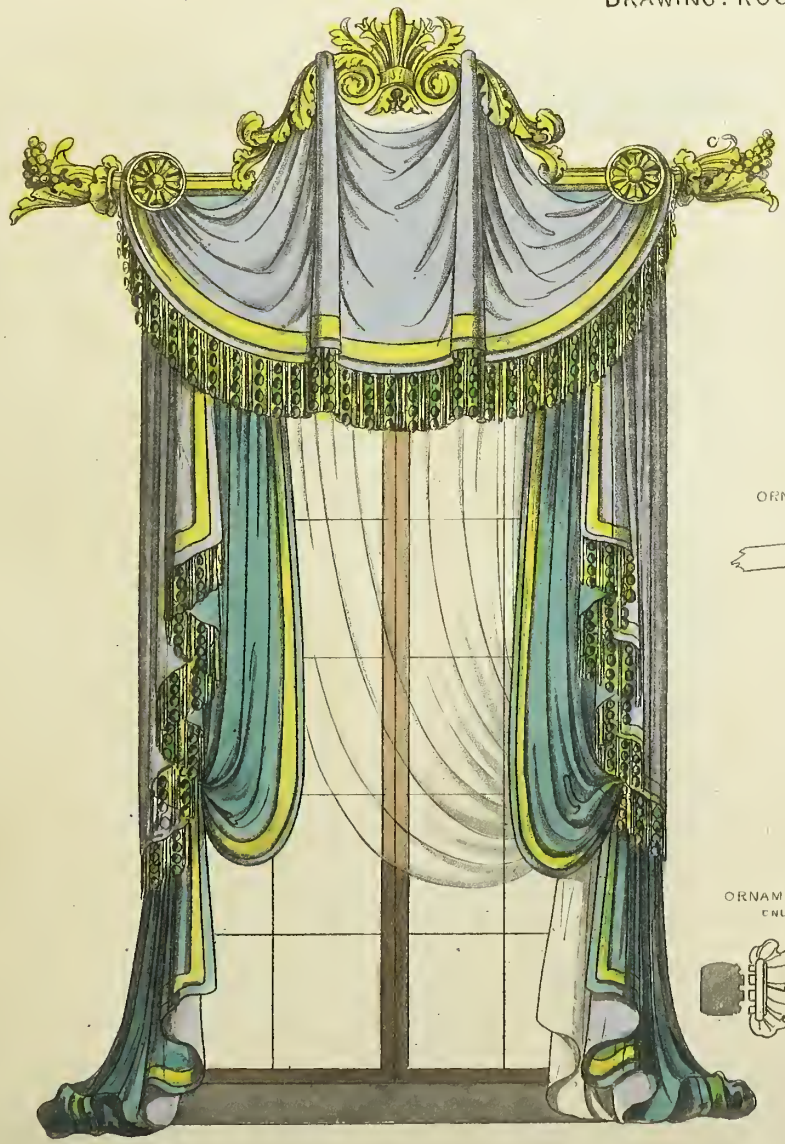
Plate CXLV.

The annexed plate represents the interior of a boudoir fitted up after the manner of a tent. In the dwellings of persons of rank and fortune, where there is a range of several rooms on a floor, one of these rooms is generally fitted up as a boudoir; an apartment specially belonging to the lady of the mansion, and fitted up accordingly. It answers as a morning room for the receiving of visitors, and in the evening makes a portion of the whole suite of apartments, when thrown open for the reception of a numerous assembly. There have been many modes adopted with regard to the fitting up and decorating the boudoir:—in the present design the representation offers the interior of a state tent, whose plan is octangular. The face of each side is covered with calico gathered into plaits, which may be either of one plain colour, or these plaits may vary alternately in colour; viz. green and white, white and pink, lilac and yellow, or otherwise, as choice and taste may dictate. The perpendicular height for the line of plaits may be nine feet six inches or ten feet, if the height of the principal story will admit; from whence the calico or furniture, covering each face of the wall will be gathered up into one common centre in the ceiling, after the manner of a tent. Along the top of the plinth or skirting of the room, a finish is made with a gold coloured rope, either of silk or worsted, and the same finishing is continued along the top of the walls from whence the tent-

like covering would spring:—it would also be continued up each angle of the sides as well as in the division of every gore formed in the tent roofing. In many cases the upright angles are finished at the top with a bow and two tassels, as in the present design. From a rich rosette in the centre of the roof, will be suspended two handsome large tassels, and frequently an ornamented valance or drapery would be continued round the walls, suspended from the upper part of the sides from whence the tent roofing would spring; the same being decorated with fringe or tassels as taste or fashion may dictate. Every appearance of architectural decoration is avoided in fitting up such an apartment, the architraves round the doors and windows being either removed or wholly covered with the furniture chosen; and this will extend to the glasses over the chimney piece and elsewhere, if more than one be introduced.

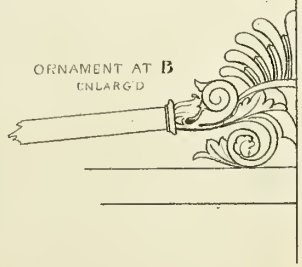
The furniture to be introduced into a room of this kind, should in itself be of a light cast:—the chairs may be of rosewood with cane seats and cushions; or the light stained chairs with coloured straw seats, as imported from France are very appropriate. Ottoman seats with cushions at the back may range round the walls of the apartment. A rosewood loo table should occupy the centre space of the floor, which in the present design partakes of the octangular form:—dejuné tables, amd light chiffoniers are admissible; and, where a recess is formed, it may be occupied by an escritoire with an ornamental French clock placed on the top:—We are not so restricted by taste or fashion, as not to admit into such an apartment, such articles as will be essential to our comfort as well as pleasing to the eye; taking care, agreeably to the Latin motto, to associate in our choice the *Utile cum Dulce.*

DRAWING. ROOM · WINDOW. CURTAINS.

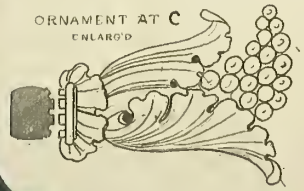


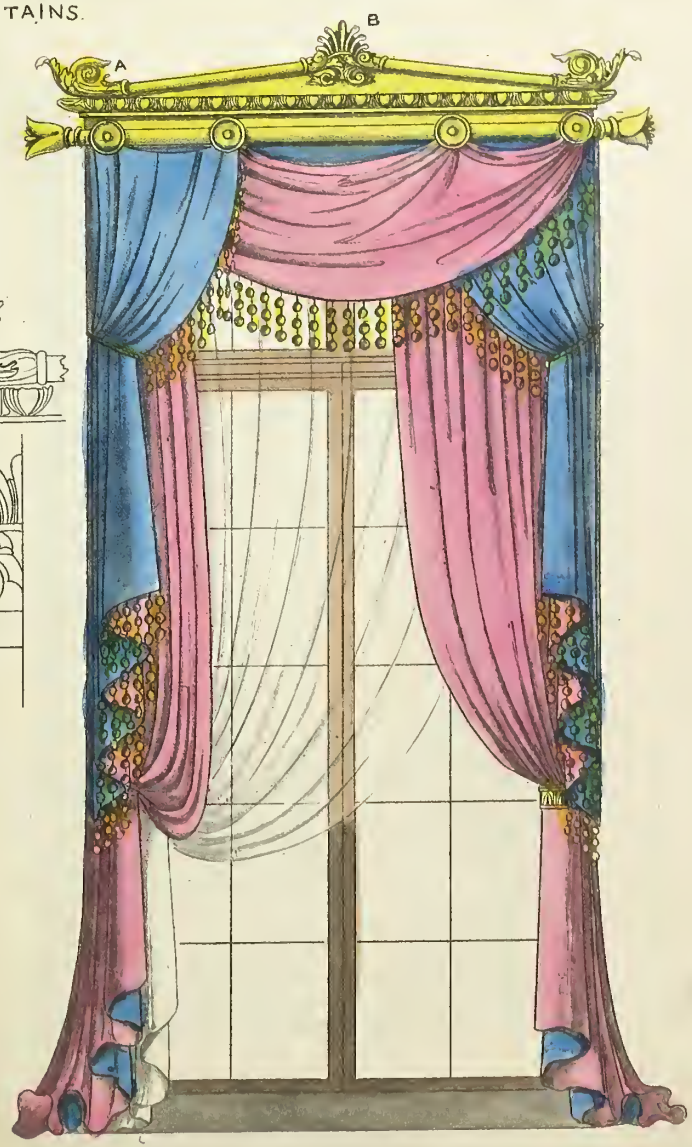
ORNAMENT AT A
ENLARG'D

ORNAMENT AT B
ENLARG'D



ORNAMENT AT C
ENLARG'D





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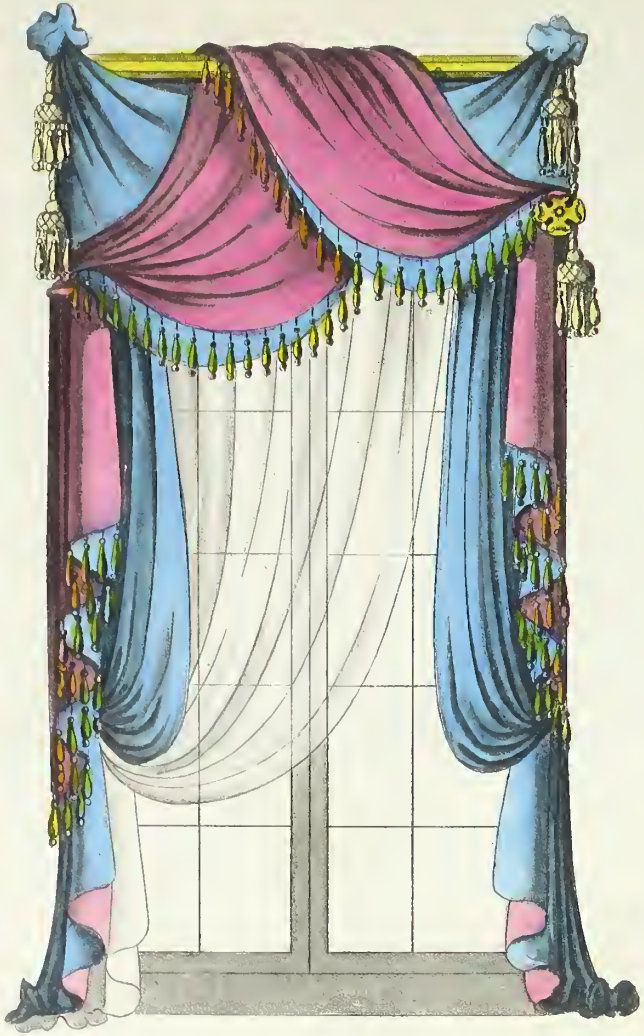
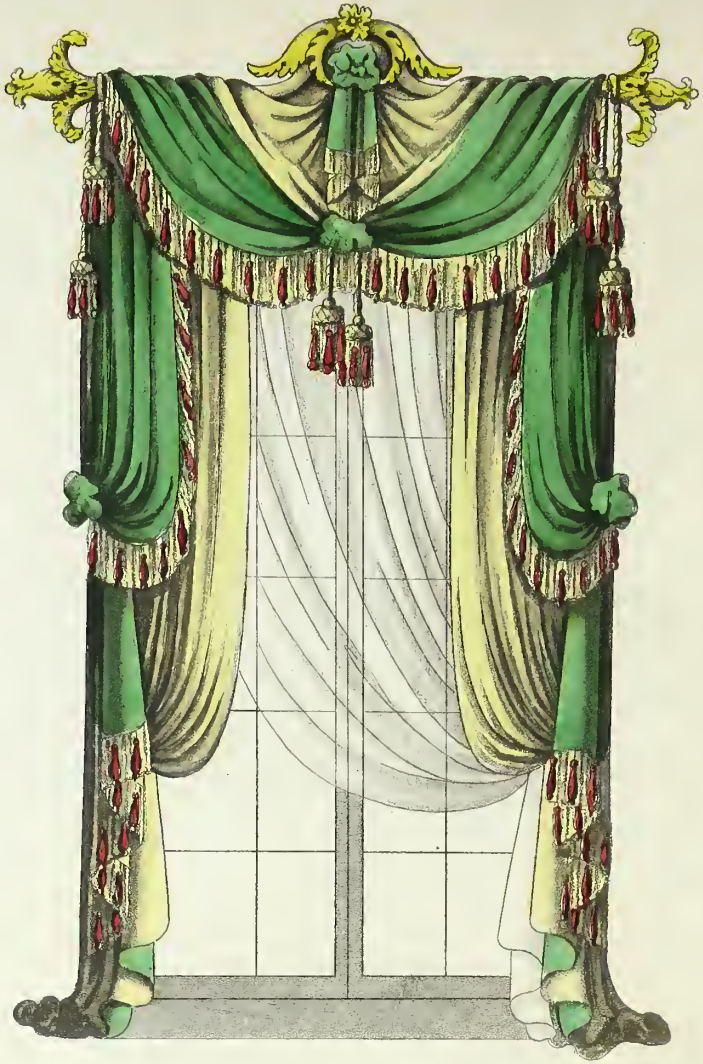


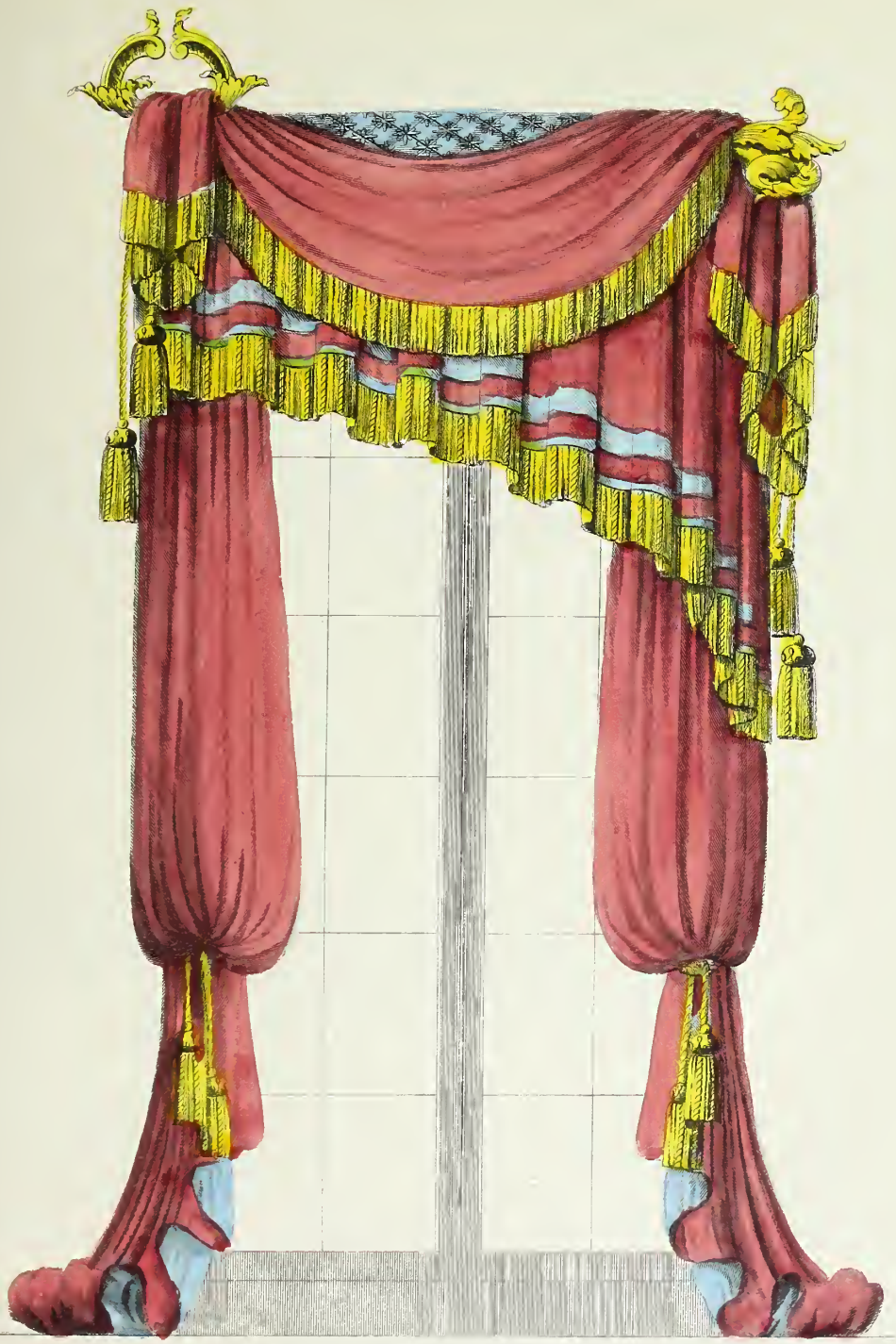


1 2 3 4 5 6 7 8 FEET

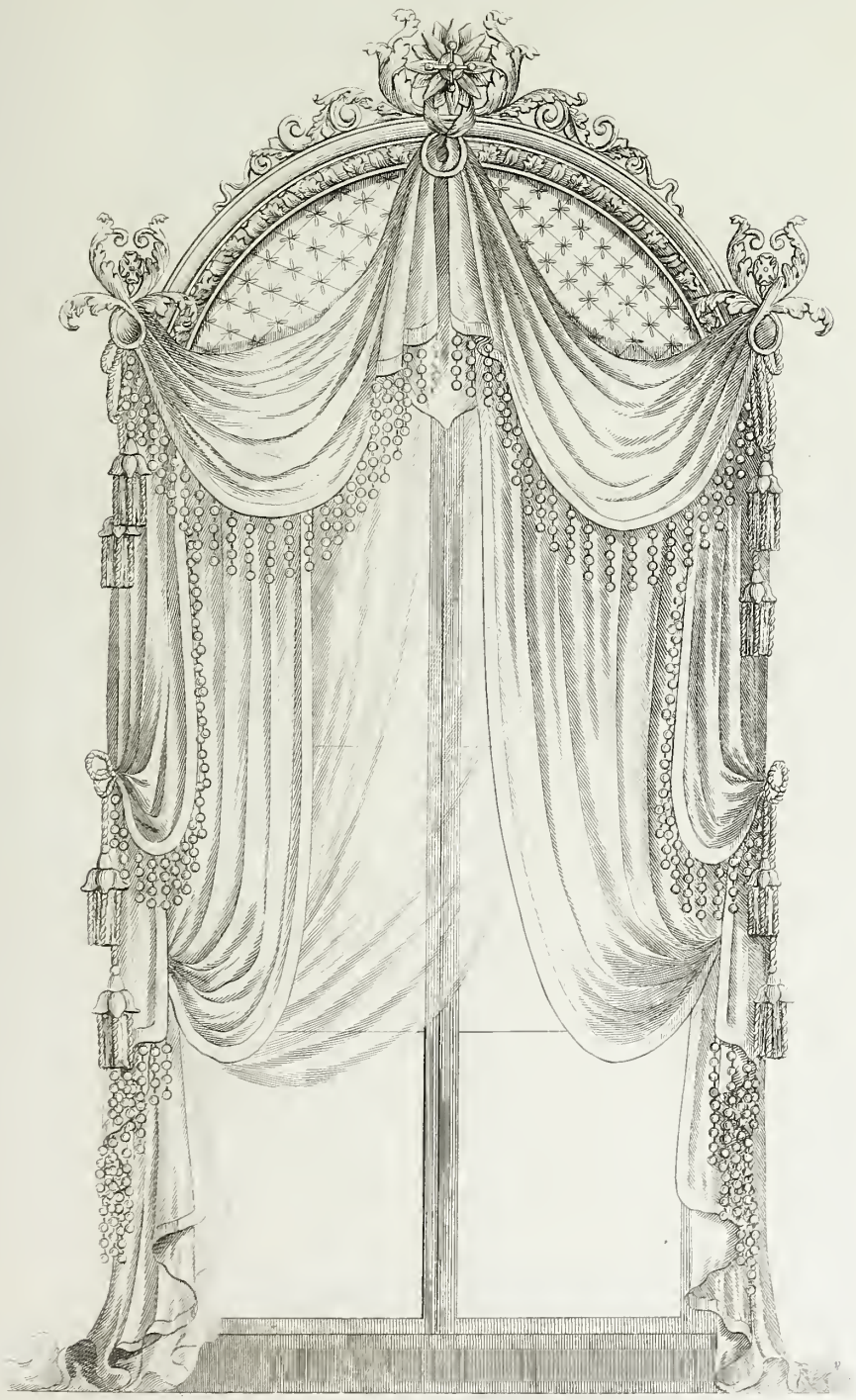
Designed by G. Smith

LONDON PUBLISHED BY JONES & Co JUNE 24. 1826

DINING ROOM WINDOW CURTAIN.



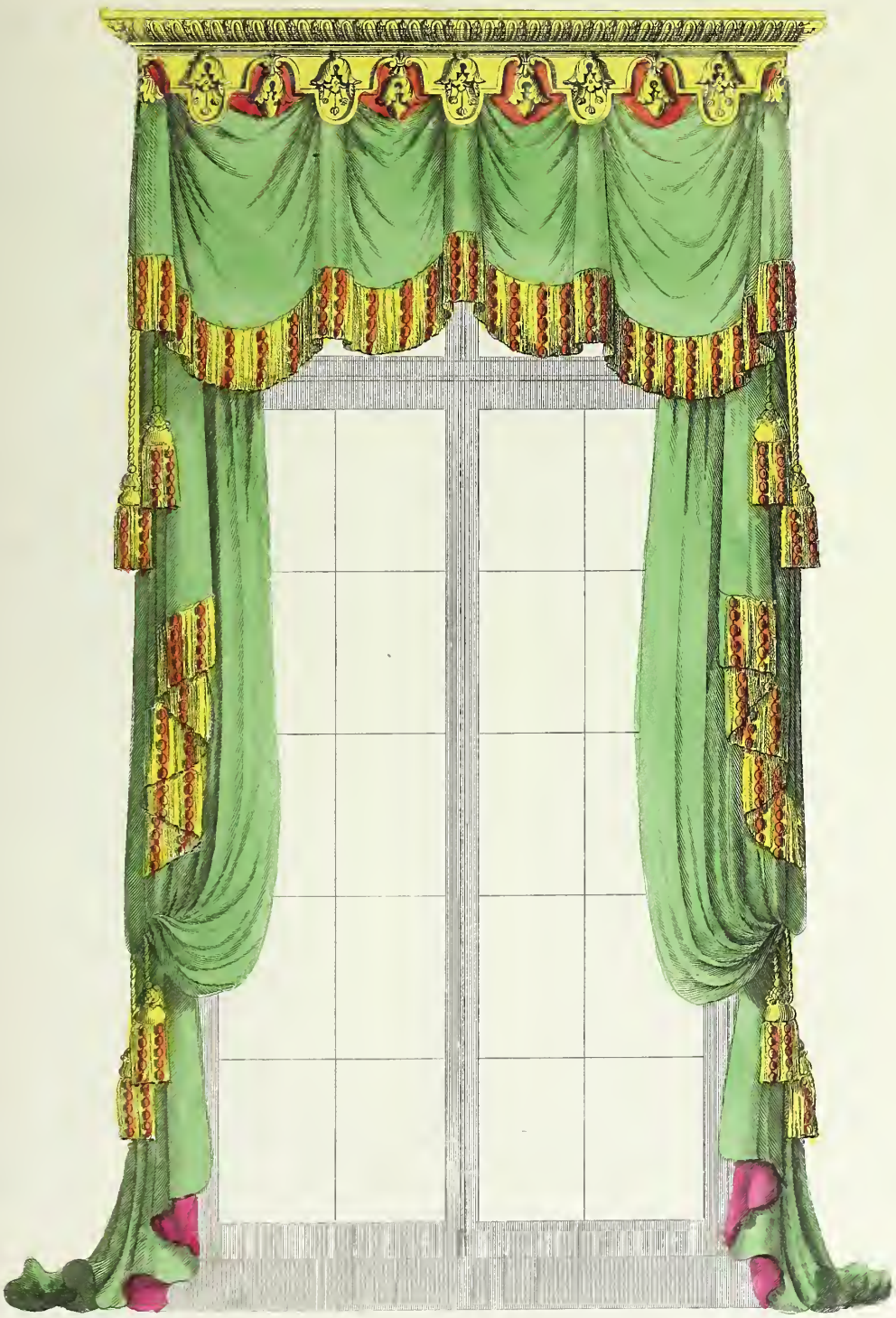
DRAPERY AND CURTAIN FOR CIRCULAR HEADED WINDOW.



0 1 2 3 4 Feet

London Published by Jones & Co. April 23 1827

DRAWING ROOM CURTAIN.

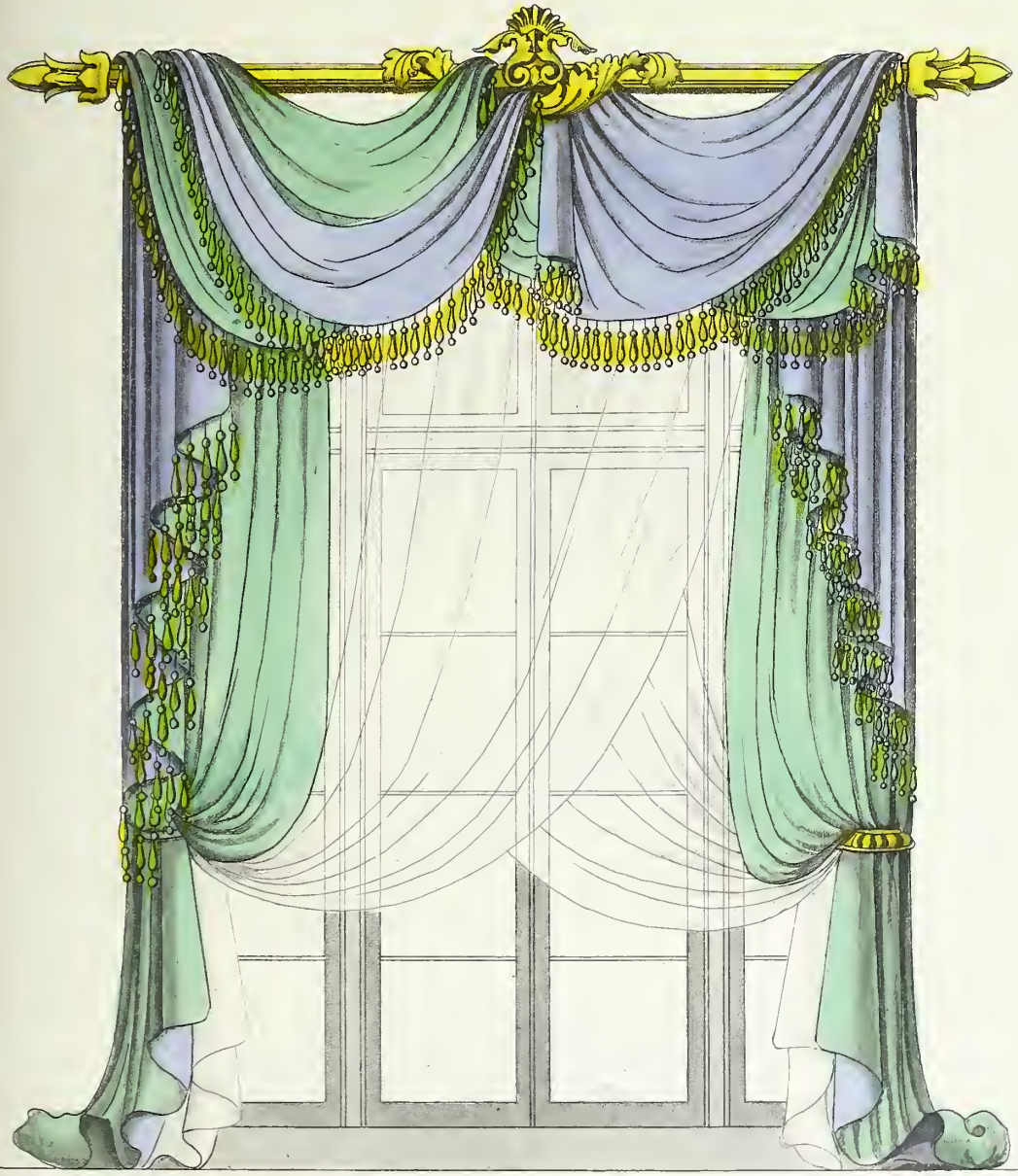


1 2 3 Inch

London Published by Jones & Co July 28 1827

VENETIAN. WINDOW. AND. CURTAIN.

III



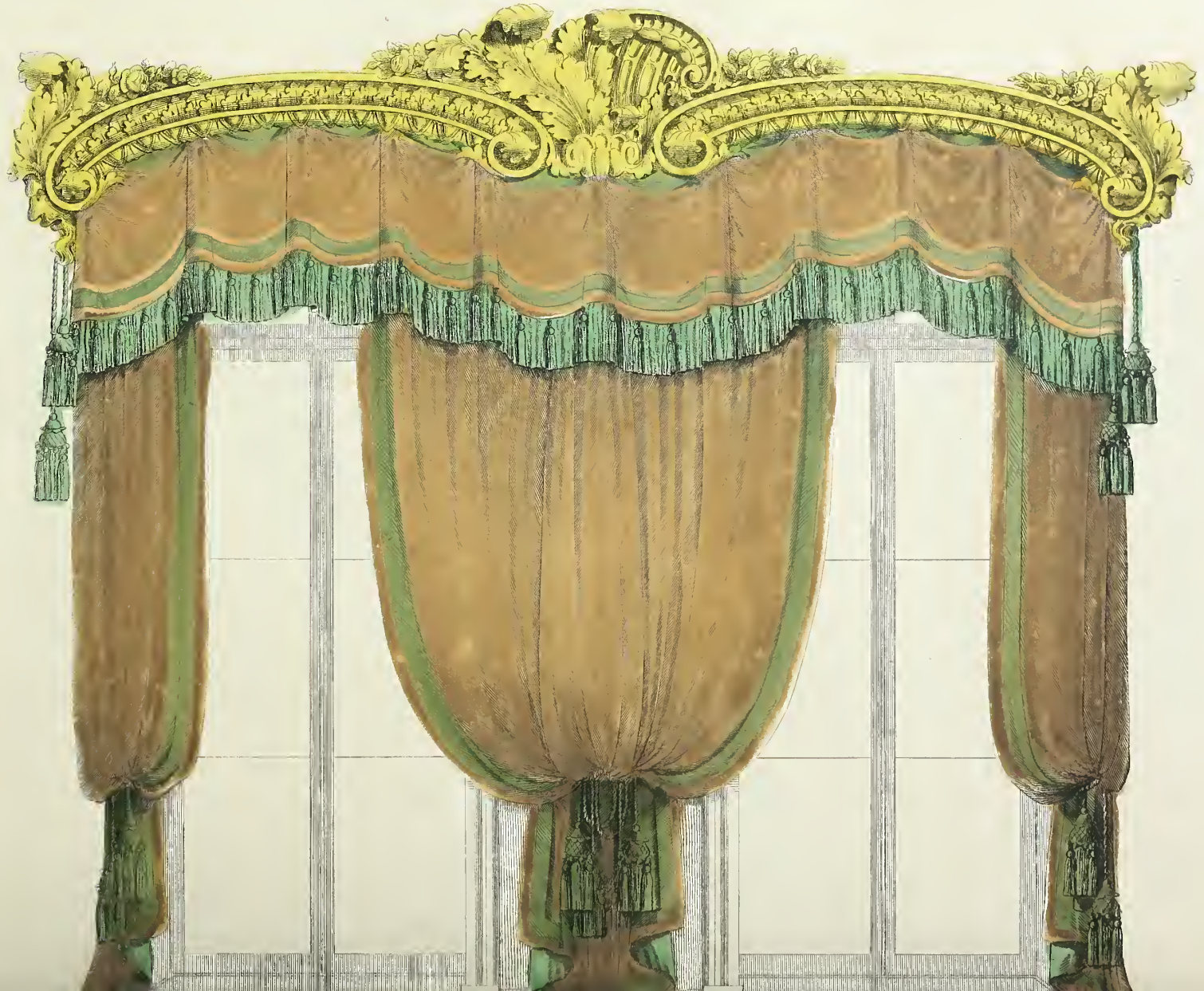
1 2 3 4 5 6 7 feet

London. Published by Jones & C° April. 29. 1826

DRAWING ROOM. WINDOW. CURTAINS. 5

1 2 3 4 5 6 7 8 Feet.

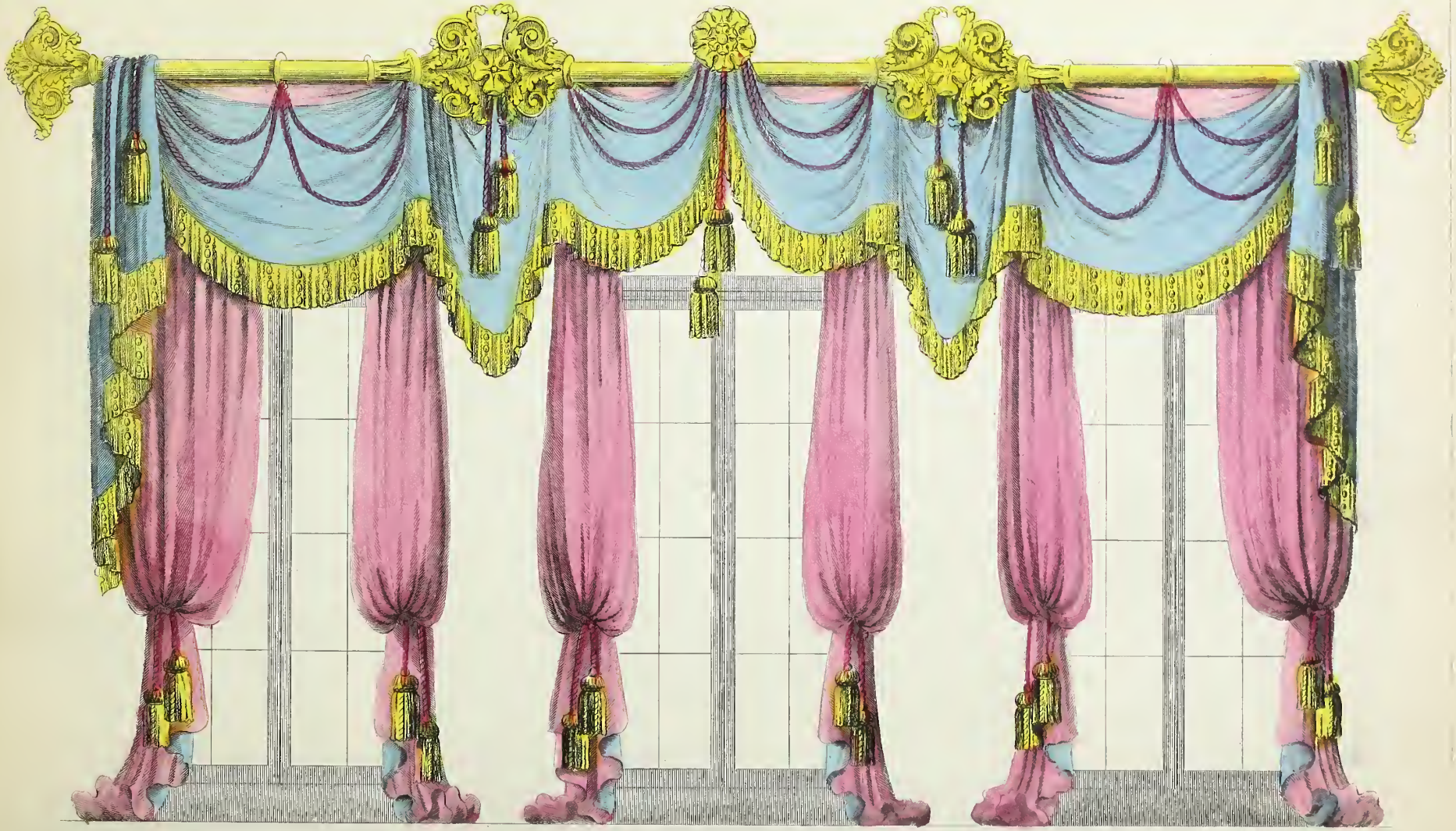
DRAWING ROOM CURTAIN.



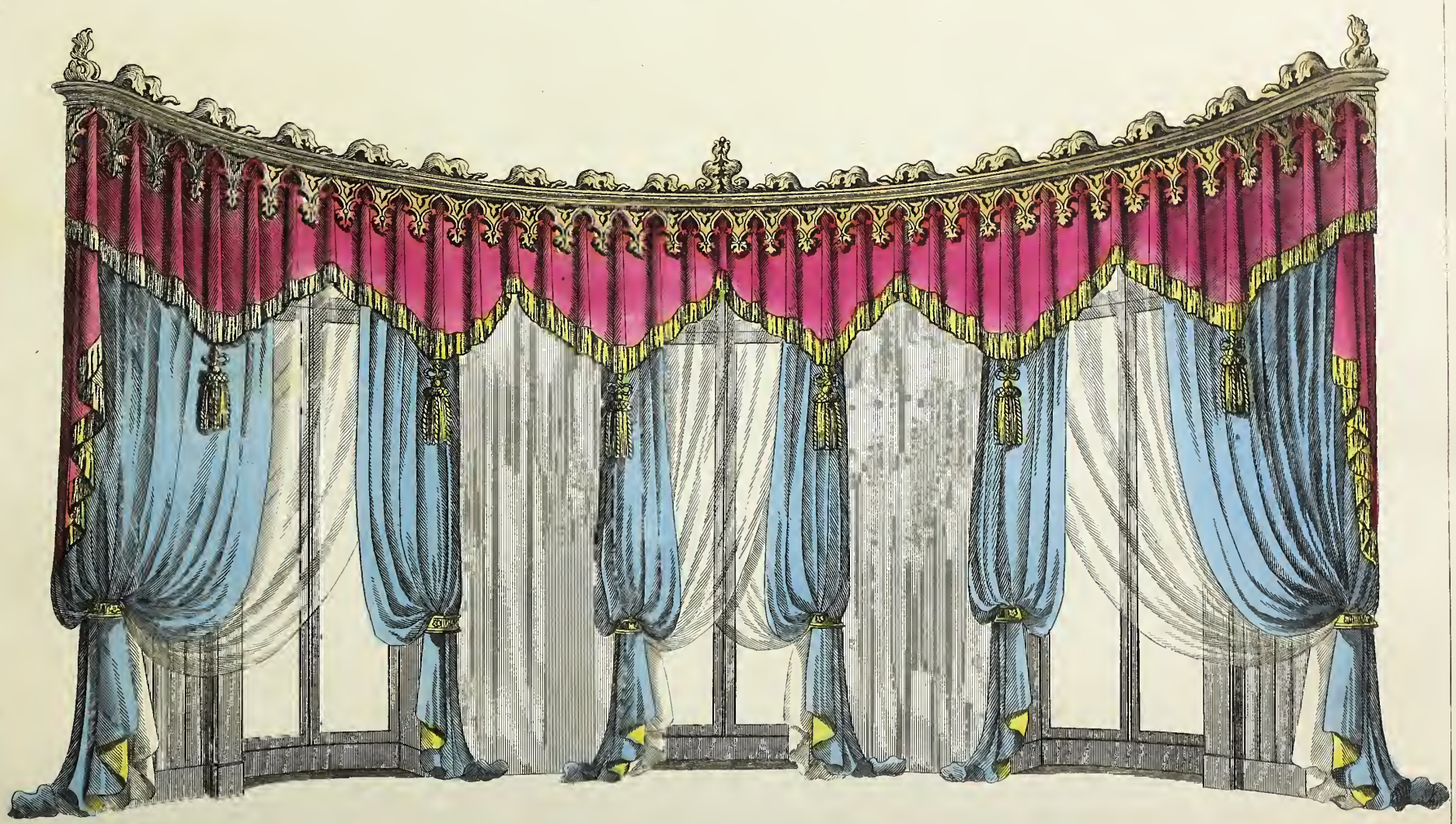
DRAWING-ROOM. WINDOW. CURTAINS. 2.

SCALE 1 2 3 4 5 6 7 8 9 FEET

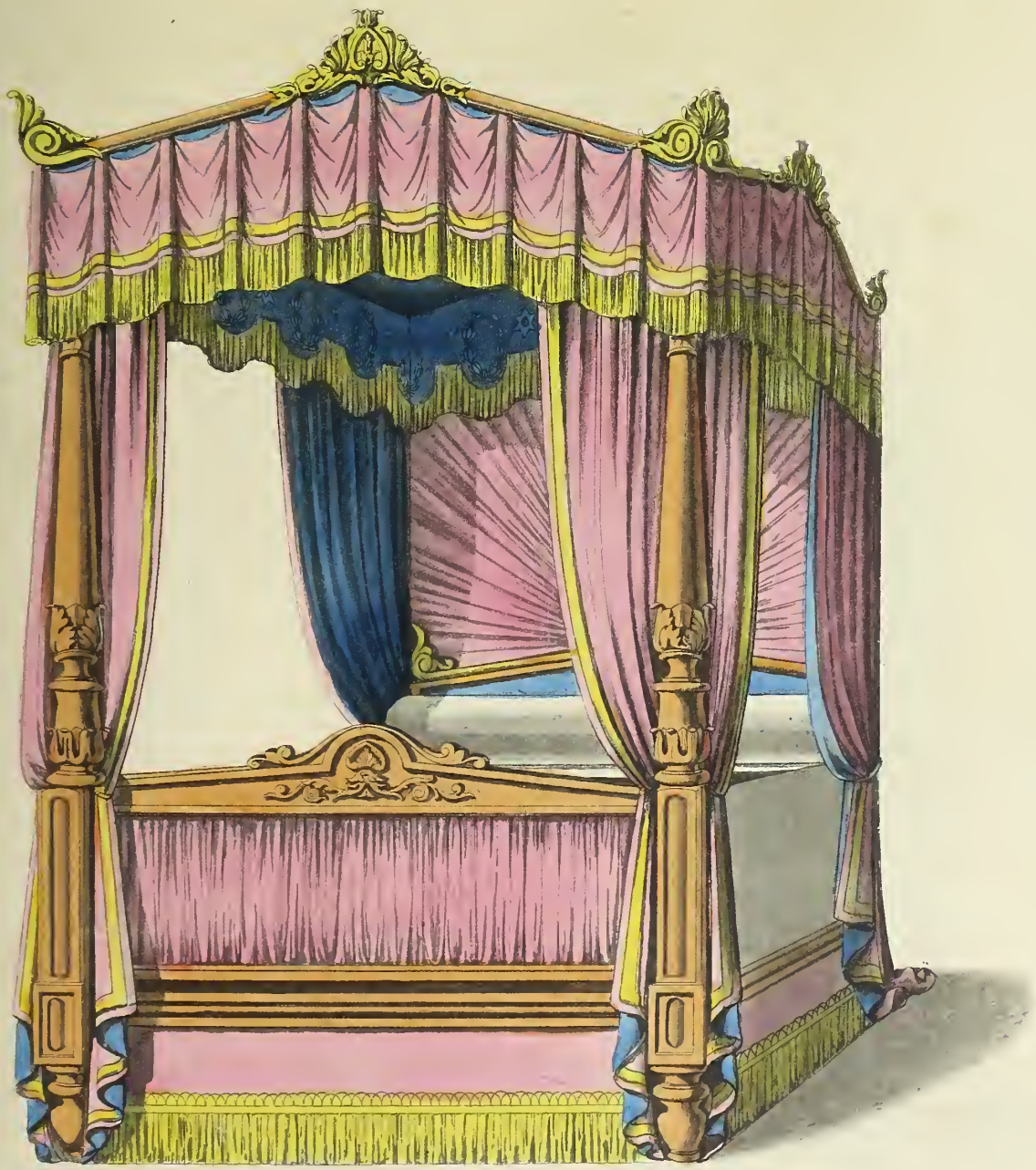
DRAWING ROOM WINDOW CURTAINS AND DRAPERY.



CURTAINS FOR A GOTHIC ROOM.



FOUR-POST. BEDSTEAD.
& FURNITURE.
I.



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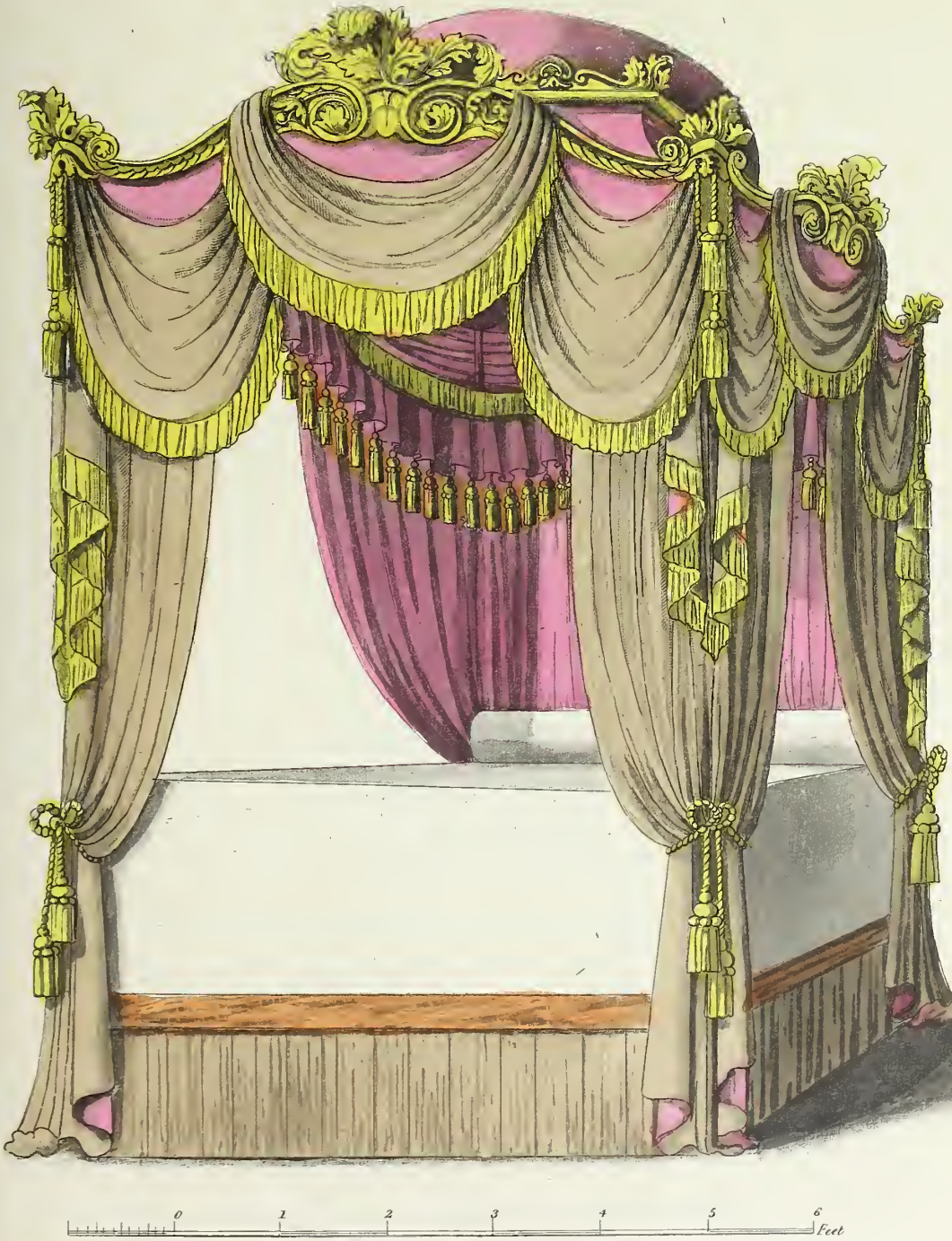
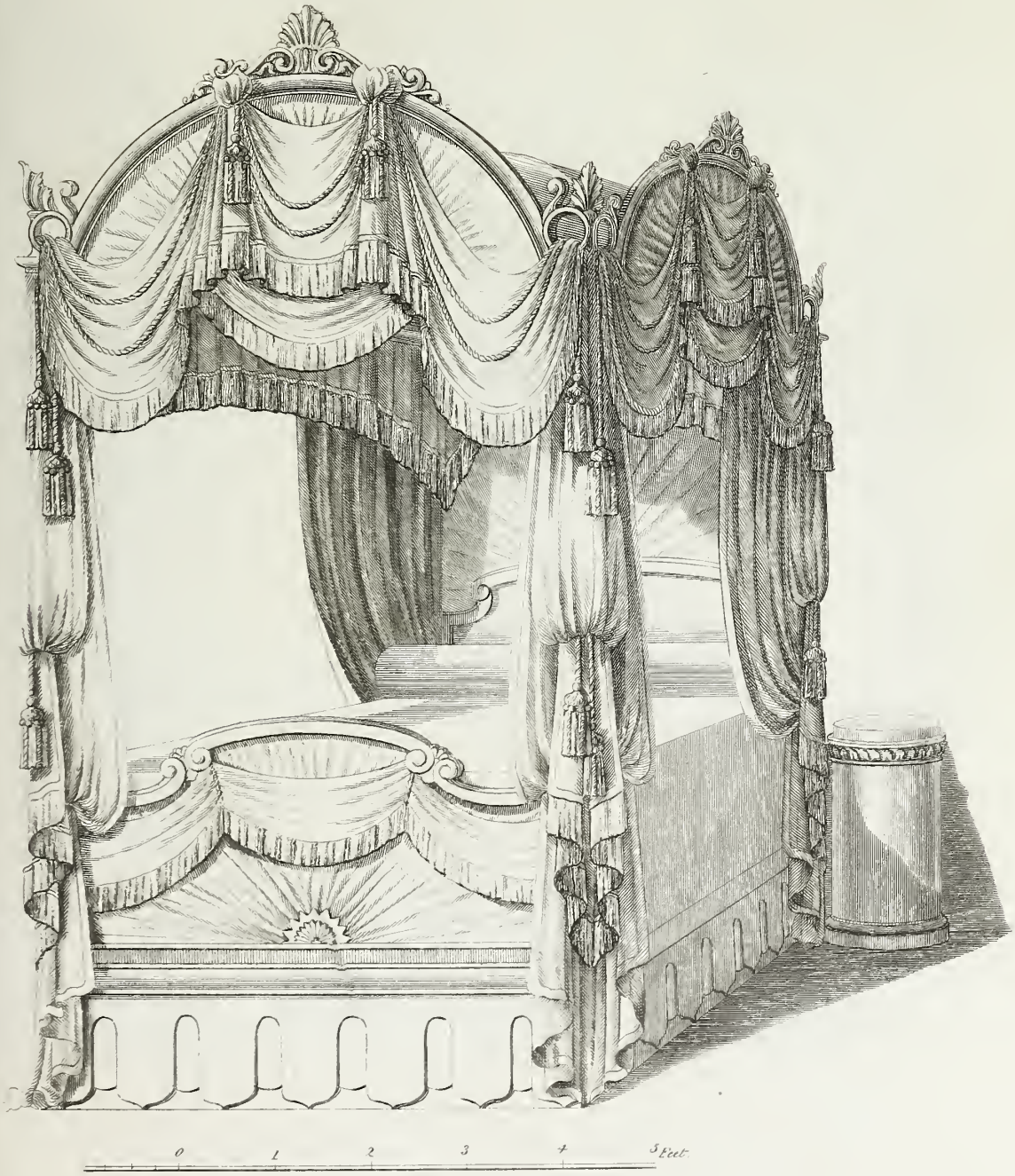
LONDON Pub^d by JONES & Co April 15. 1826.

FOUR. POST. DOME. BED.



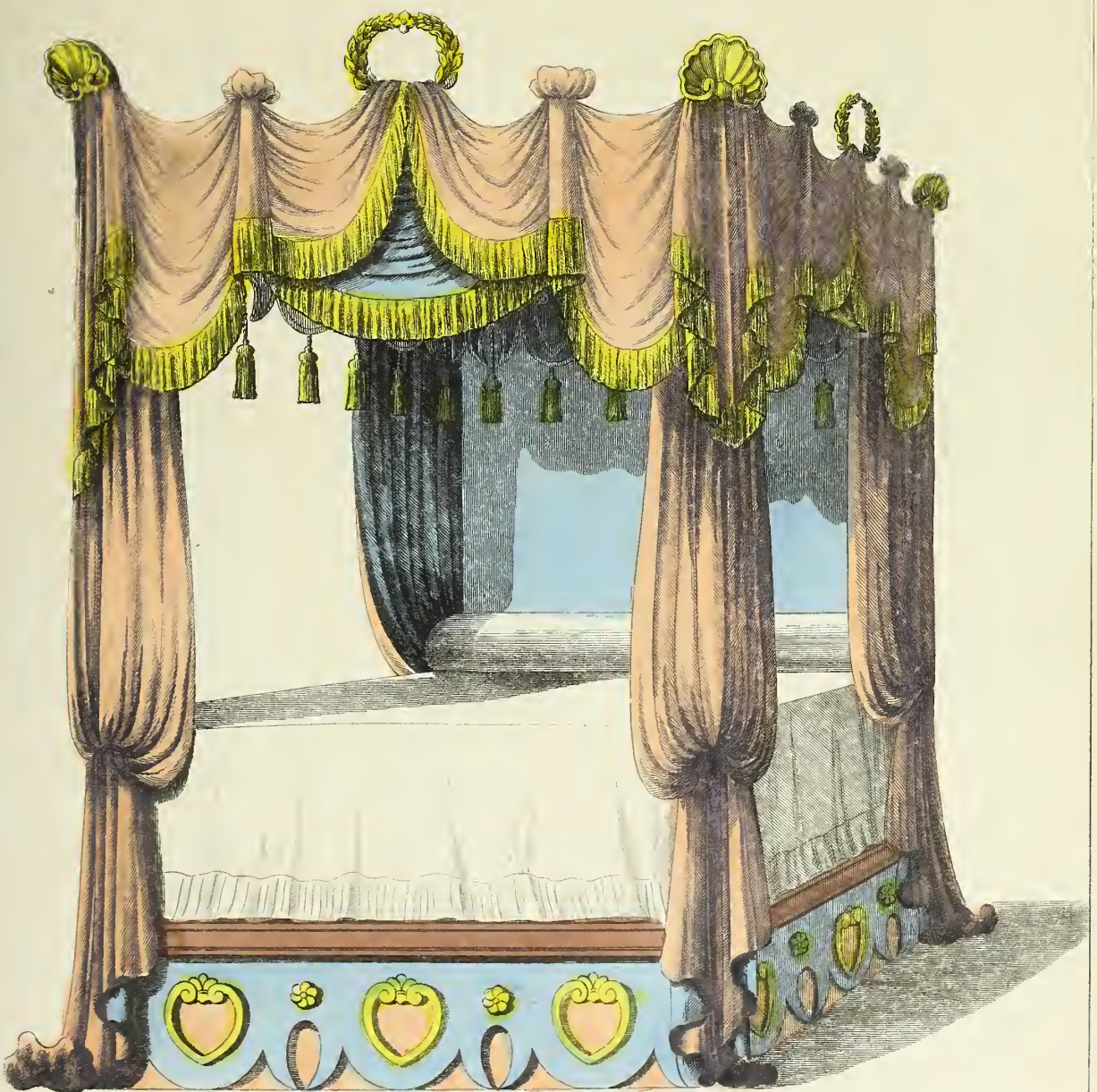
London Published by Jones & Co Sept.r 2. 1826

GROIN'D TEASTER BEDSTEAD.



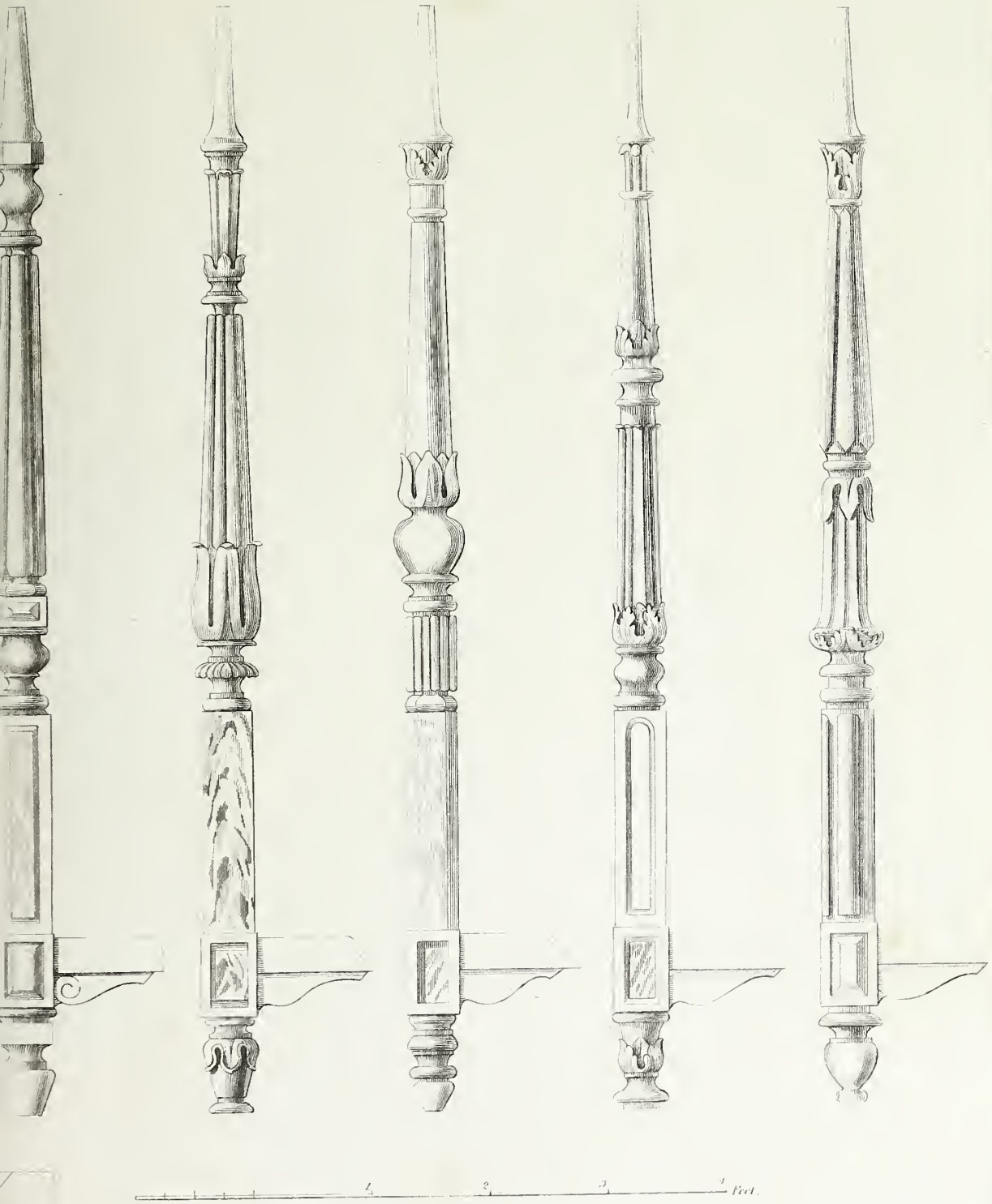
London. Published by Jones & Co April 21. 1827

FOUR POST BEDSTEAD.



London, Published by Jones & C° July 21. 1827.

BED PILLARS.



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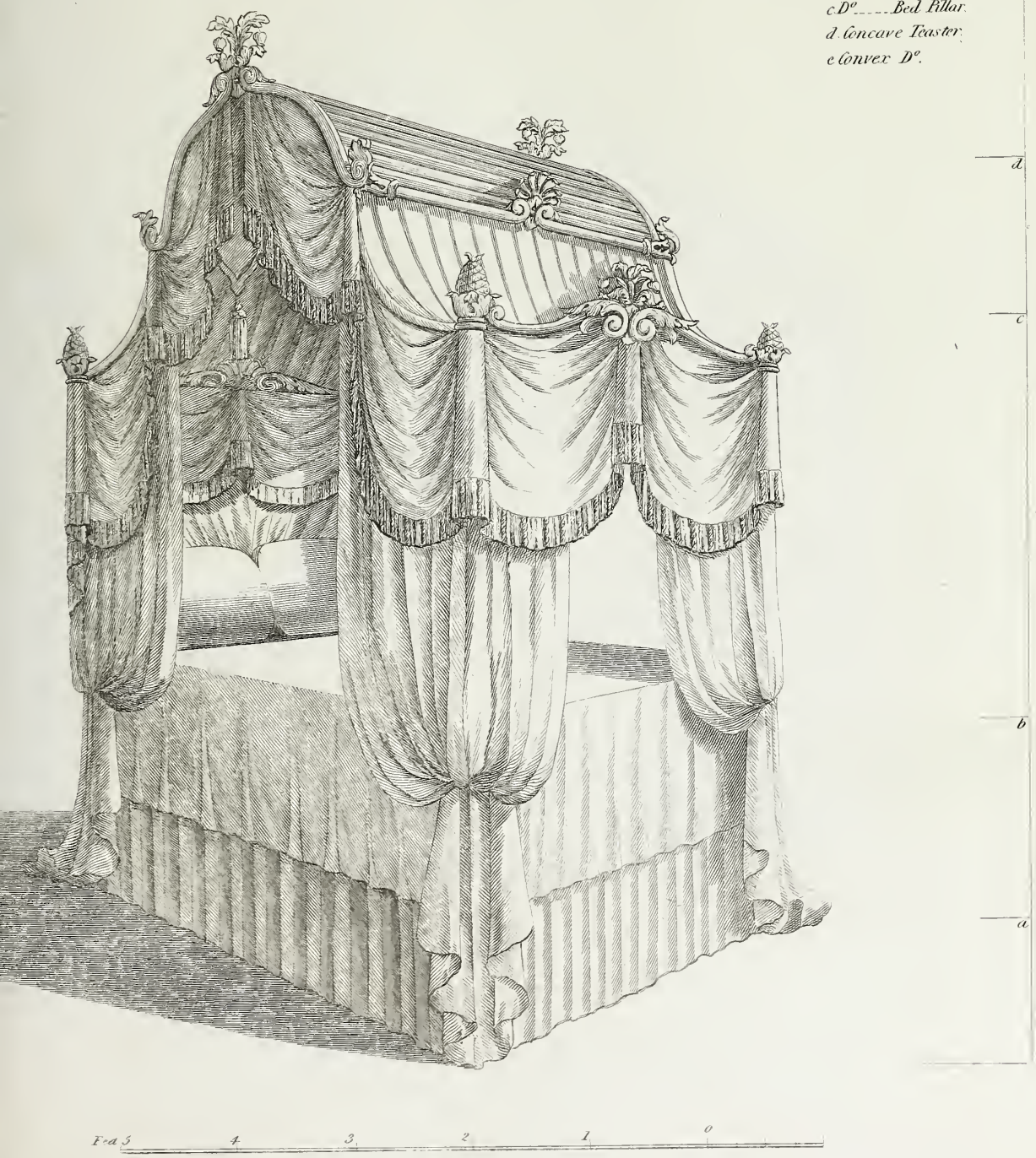

London Published by Jones & Cº April 28 1827

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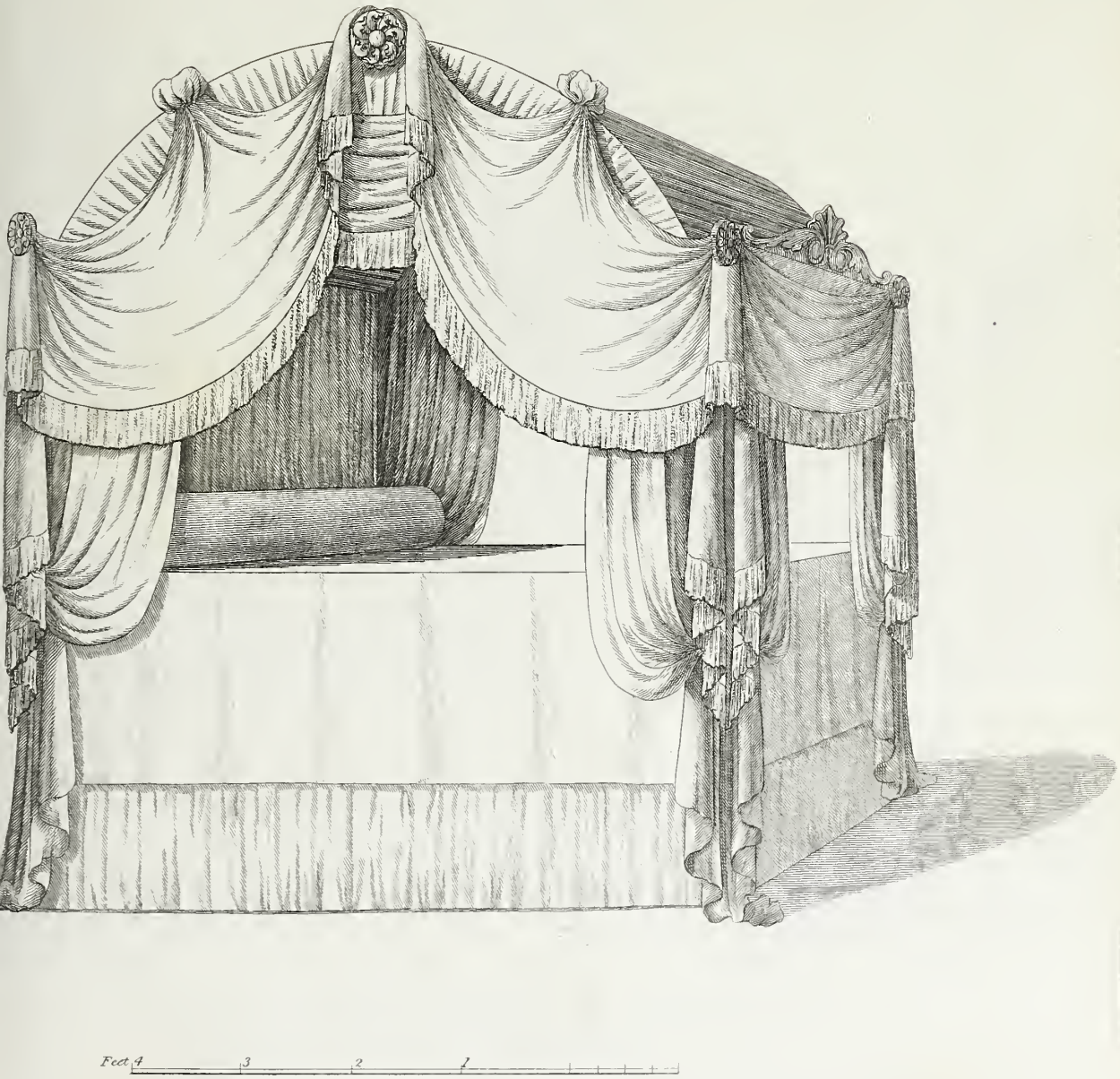
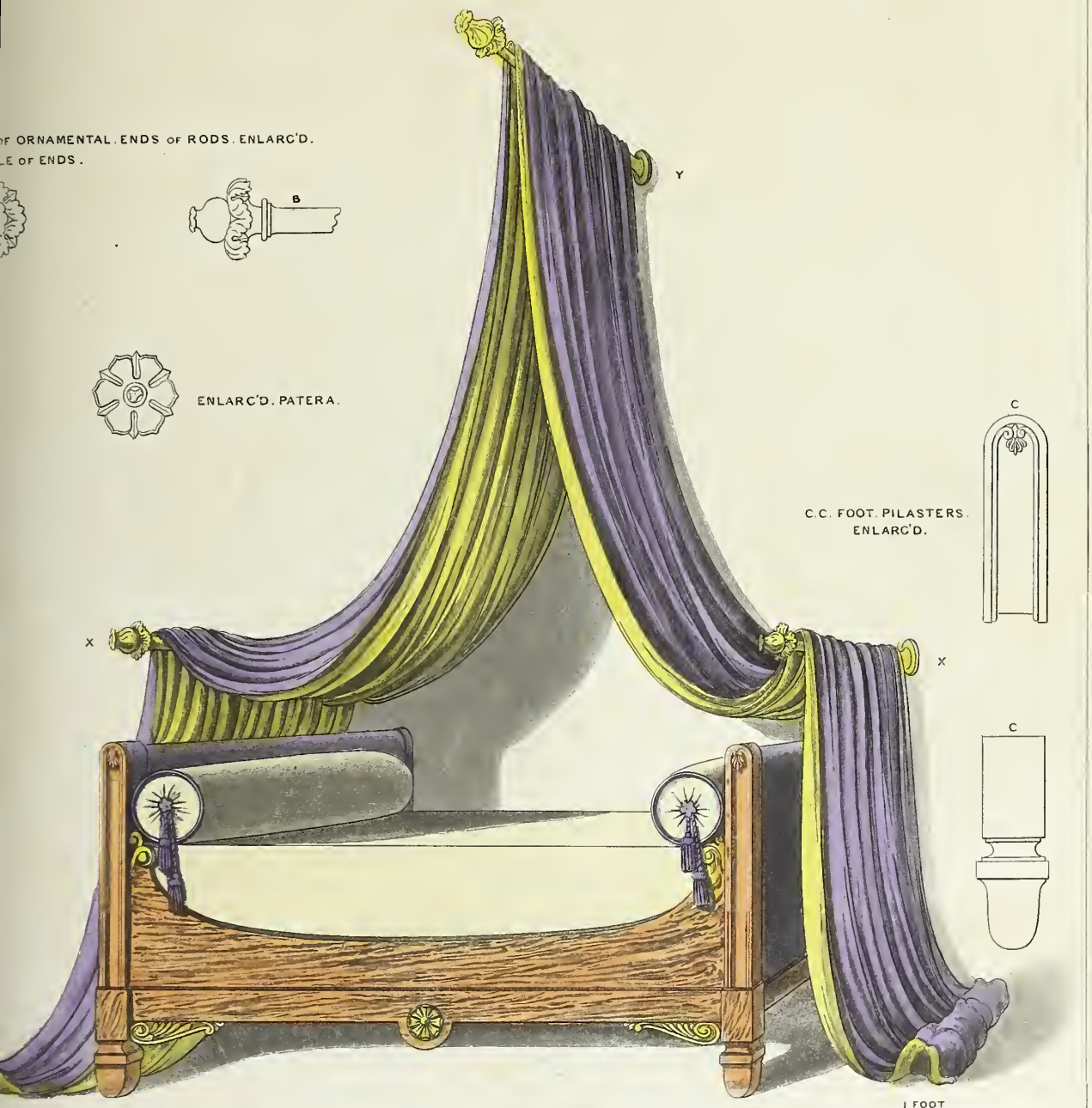


London Published by Jones & C. March 24 1827

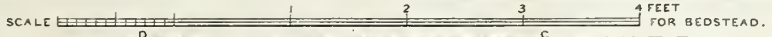
FRENCH-BED.

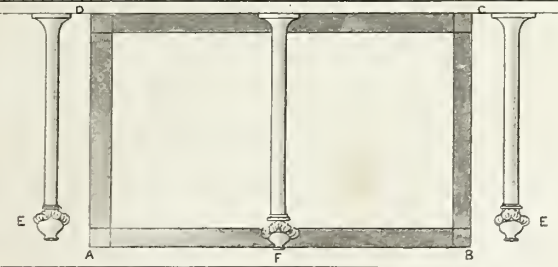
OF ORNAMENTAL. ENDS OF RODS. ENLARC'D.
LE OF ENDS.

ENLARC'D. PATERA.



C.C. FOOT. PILASTERS.
ENLARC'D.





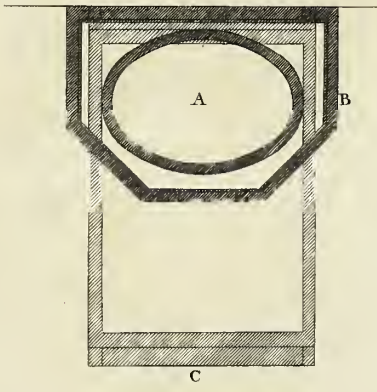
A B C D. PLAN OF BEDSTEAD ON $\frac{1}{2}$ SCALE.
E E. RODS. SUPPORTING. CURTAINS. AT X.X.
F. ROD. SUPPORTING. CURTAINS. AT Y.

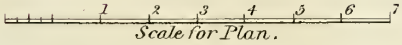
Aquatinted by Hodges.

LONDON Pub^{d} by JONES & C^{o} May. 6. 1826.

FRENCH DOME BED.

A. *The Plan of Canopy and Dome.*
B. *Plan of Teaster.*
C. *Plan of Bedstead.*

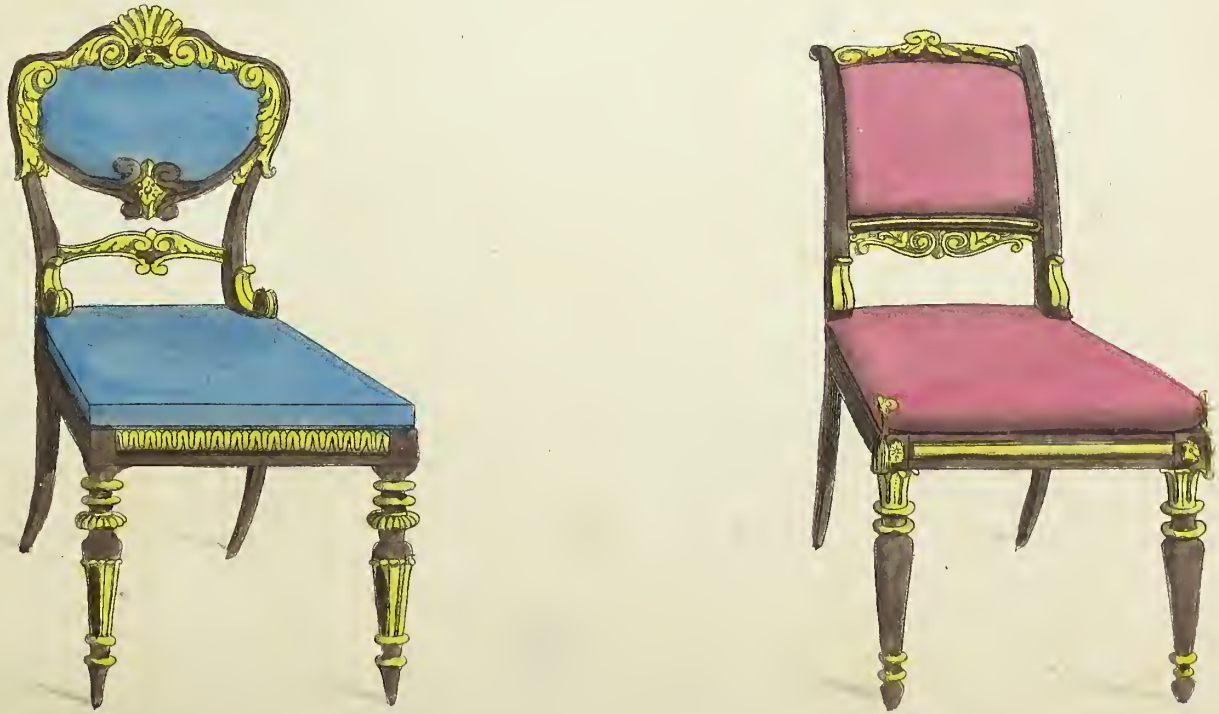




Scale for Plan.

London Published by Jones & Co. Aug 19 1826

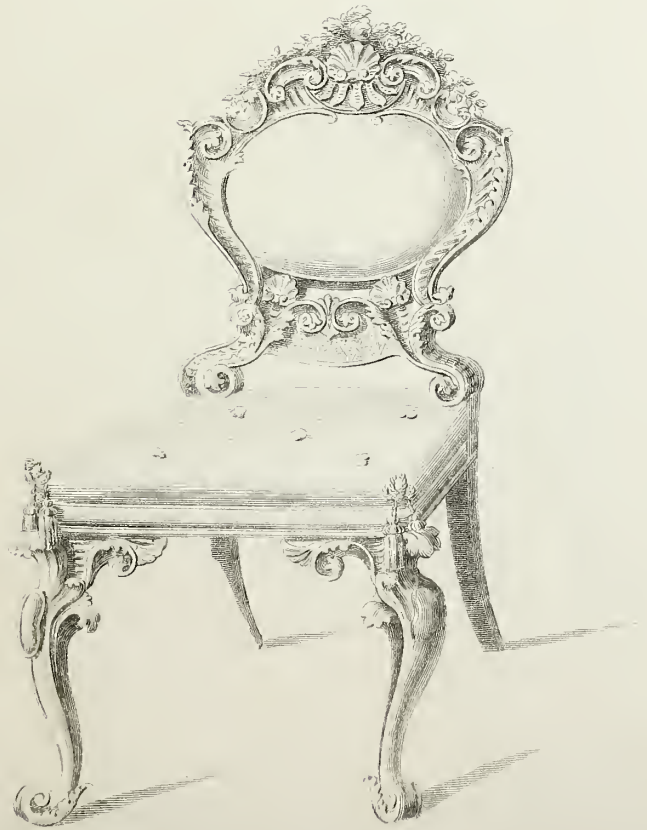
DRAWING . ROOM . CHAIRS.



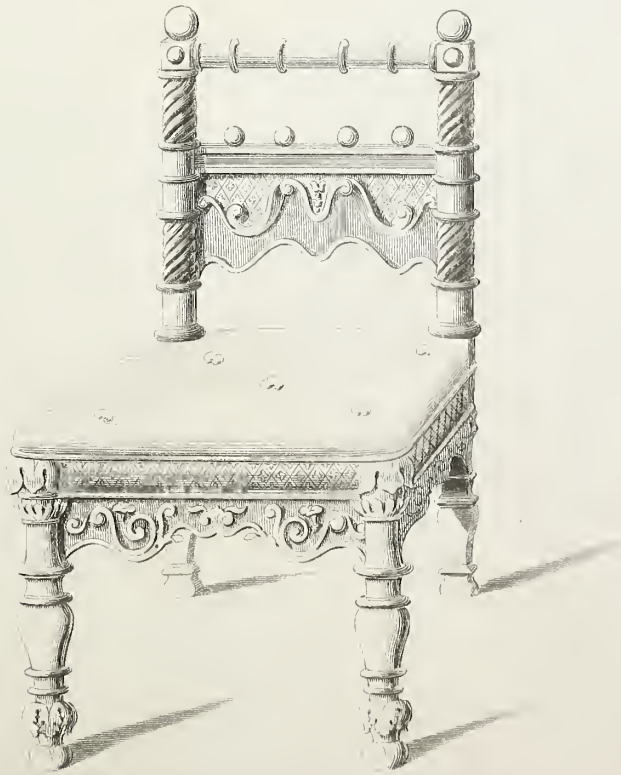
SCALE 1 0 1 2 1 FEET

ANTIQUE CHAIRS.

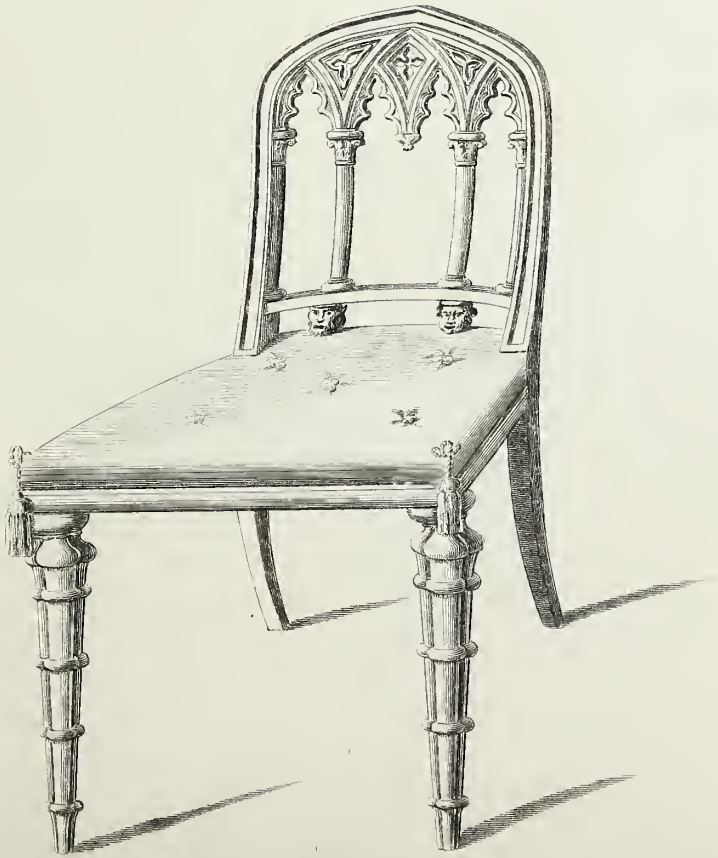
French.

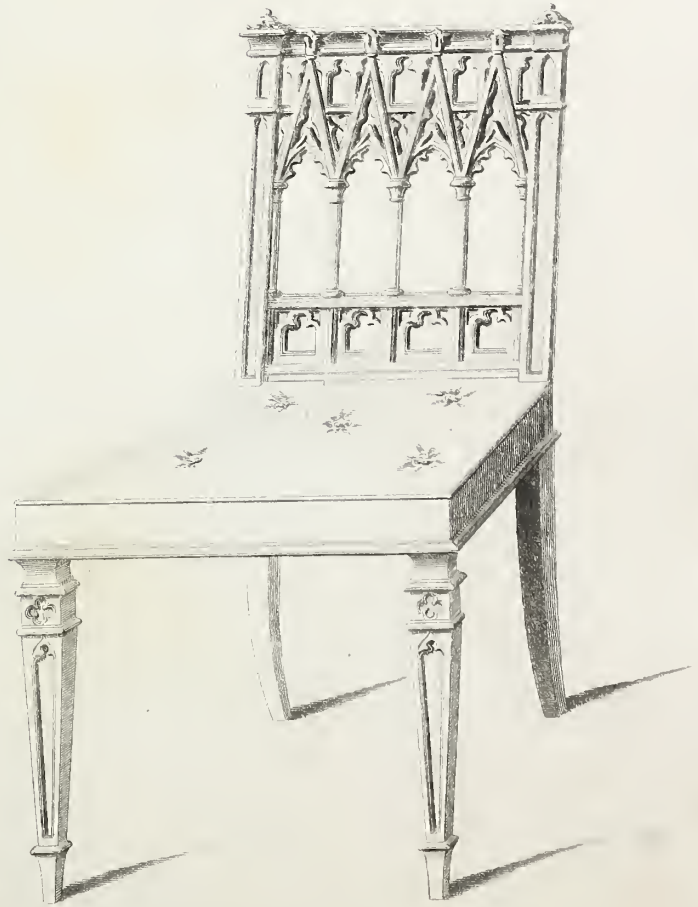


Indian.

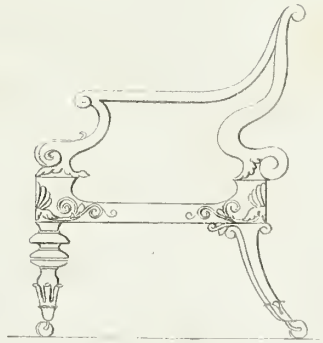


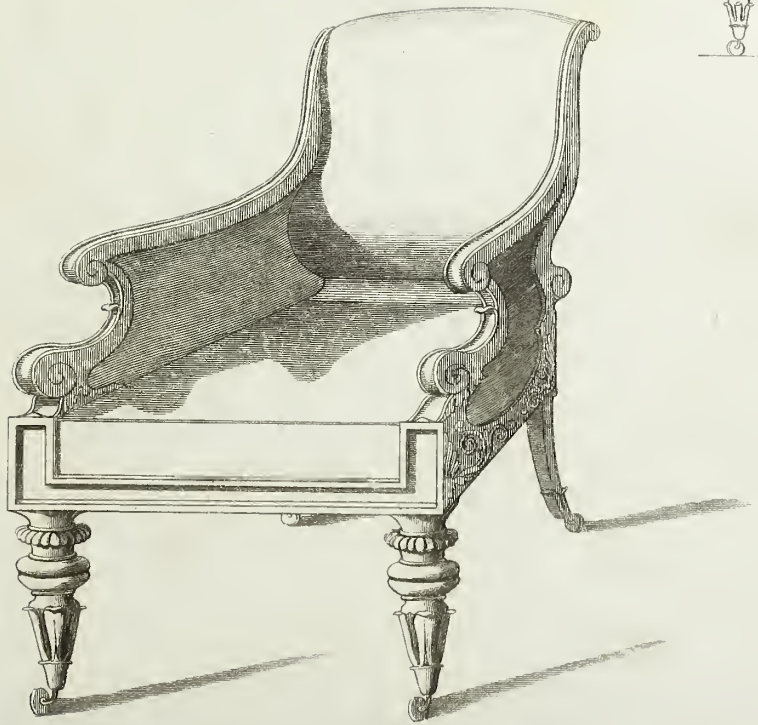
DRAWING ROOM AND DINING ROOM GOTHIC CHAIRS.

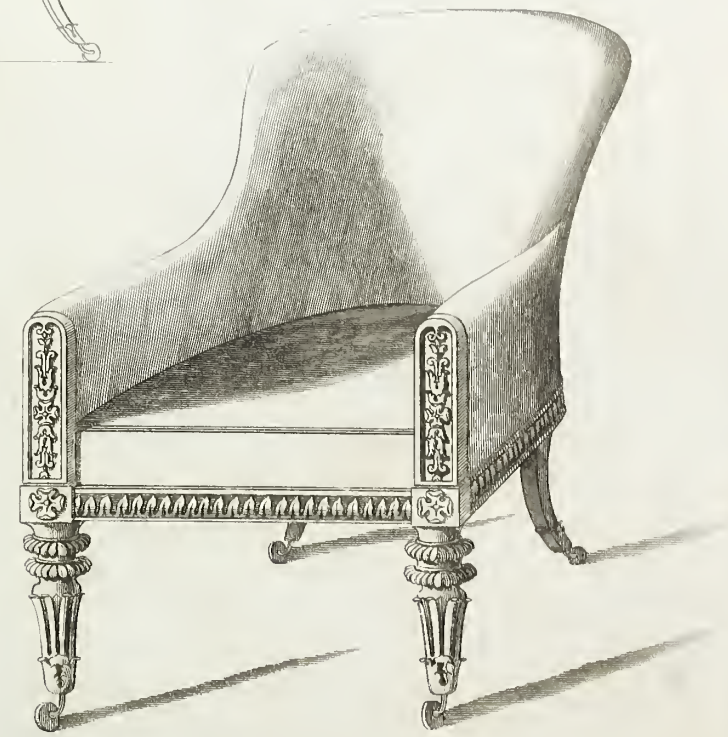




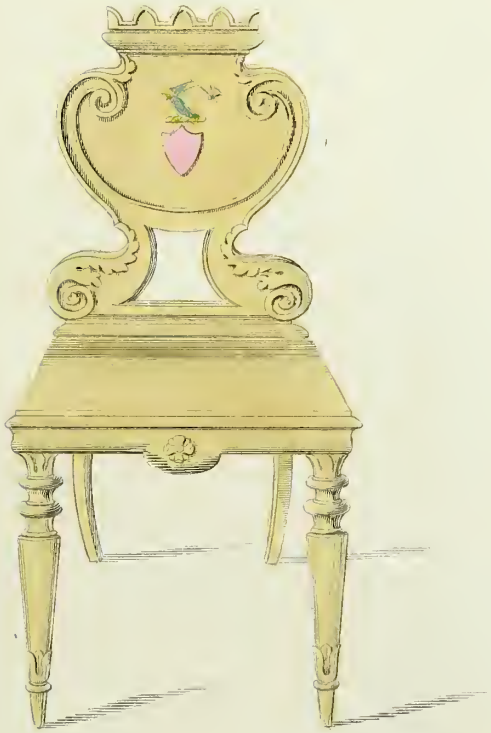
DRAWING ROOM FAUTEUILS.



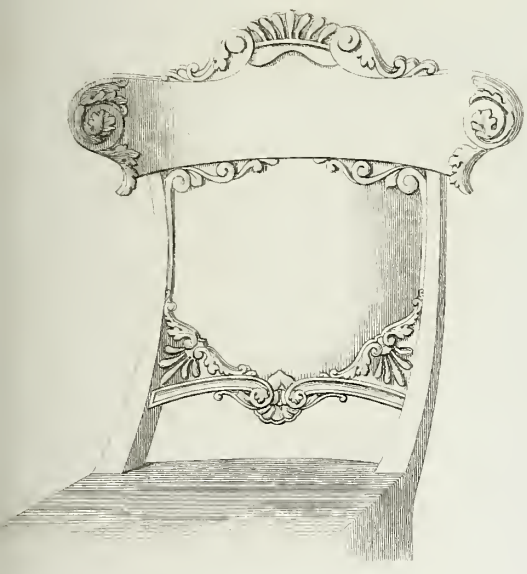


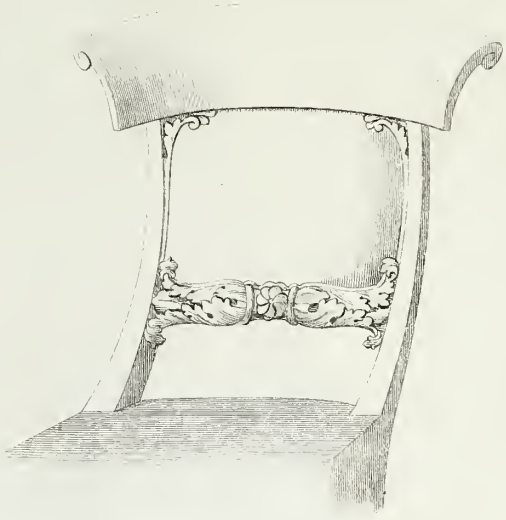


HALL CHAIRS.

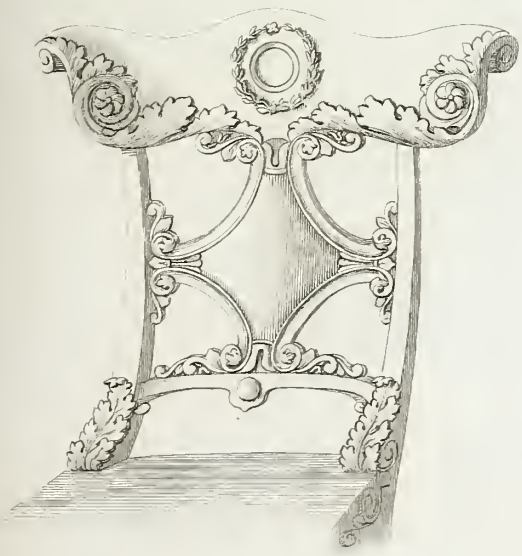


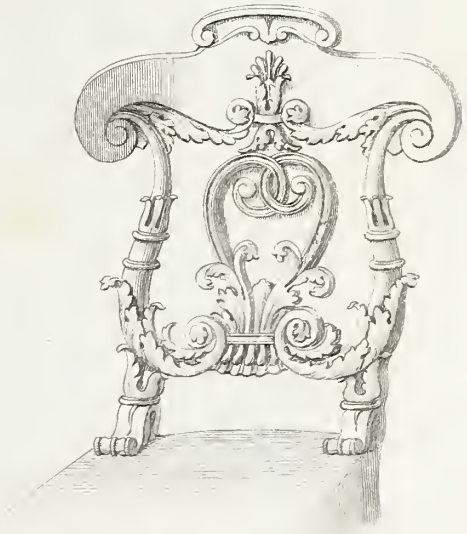
DINING ROOM CHAIR BACKS.





DRAWING ROOM CHAIR BACKS.





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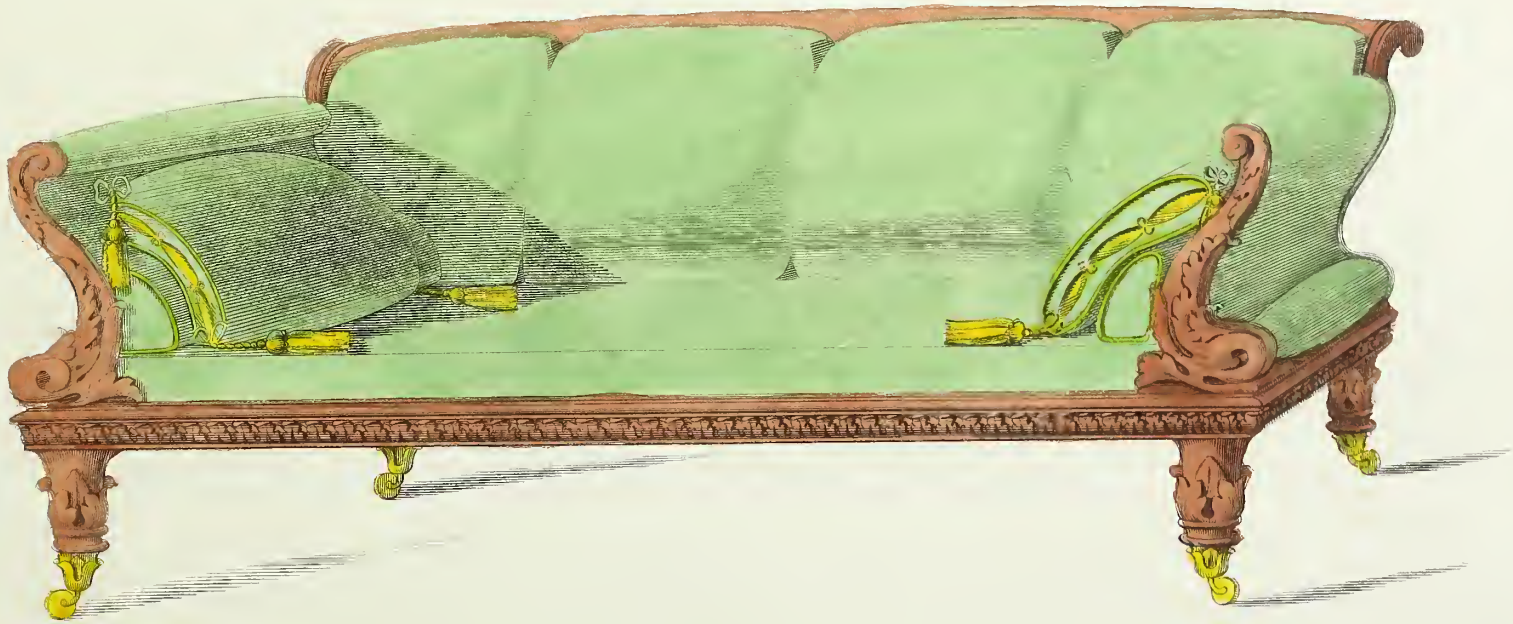
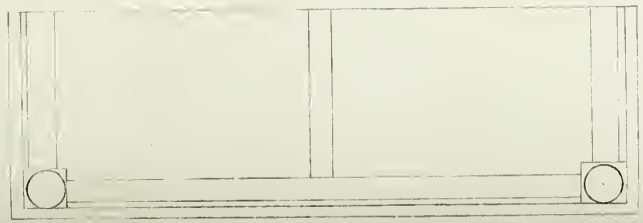
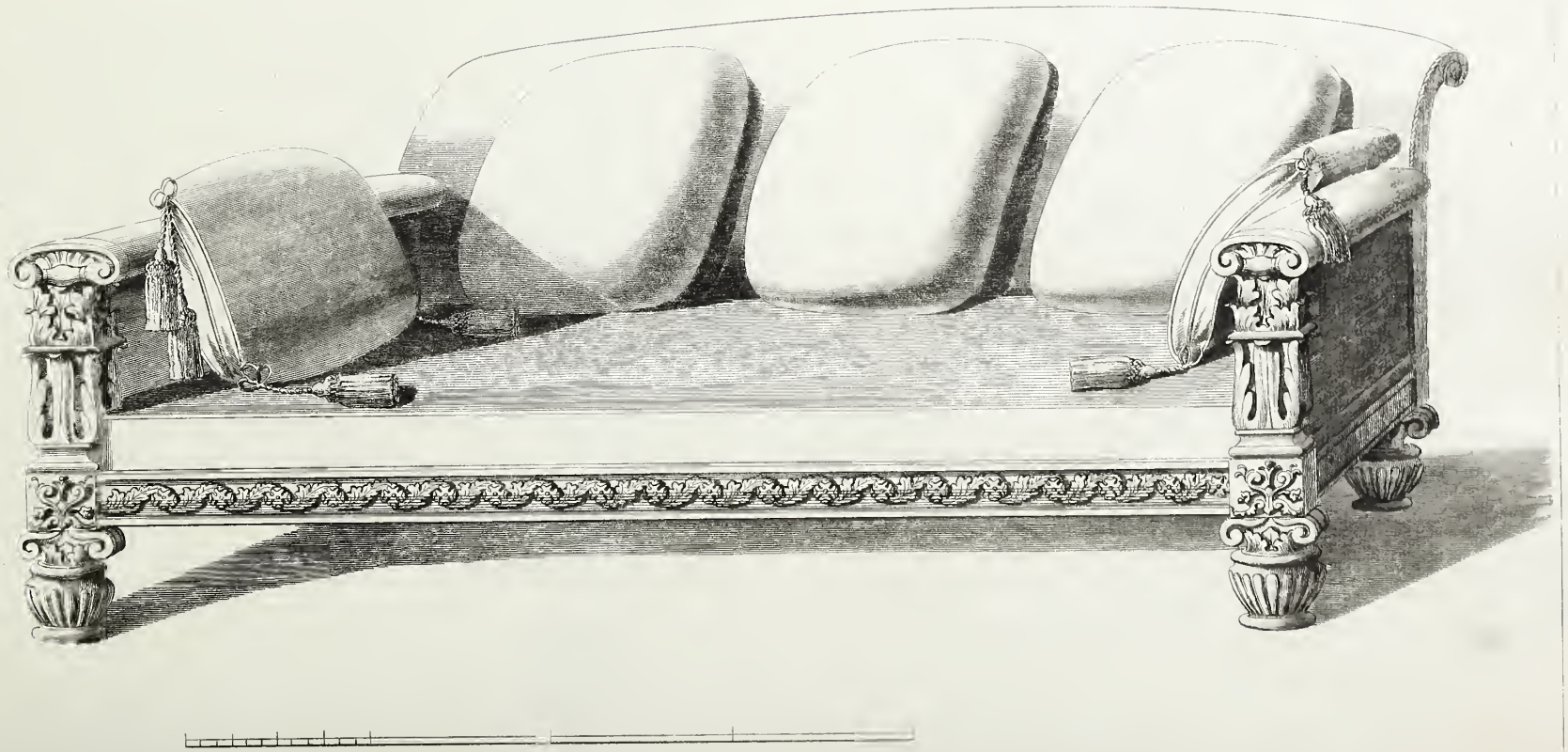
DRAWING ROOM SOFA.



Plan of Sofa Half Size.

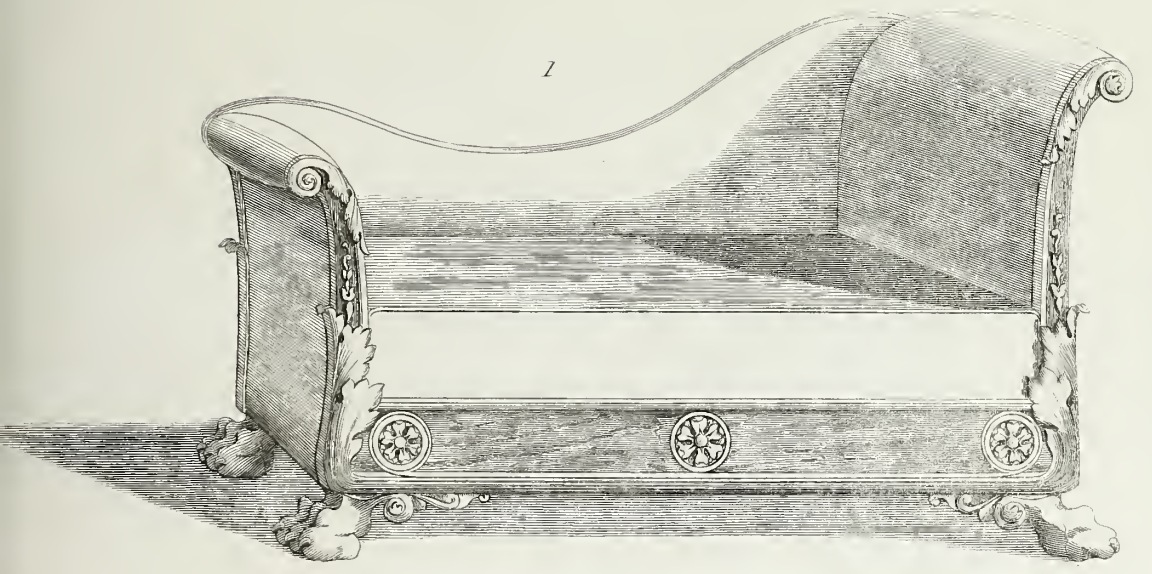


DRAWING ROOM SOFA.



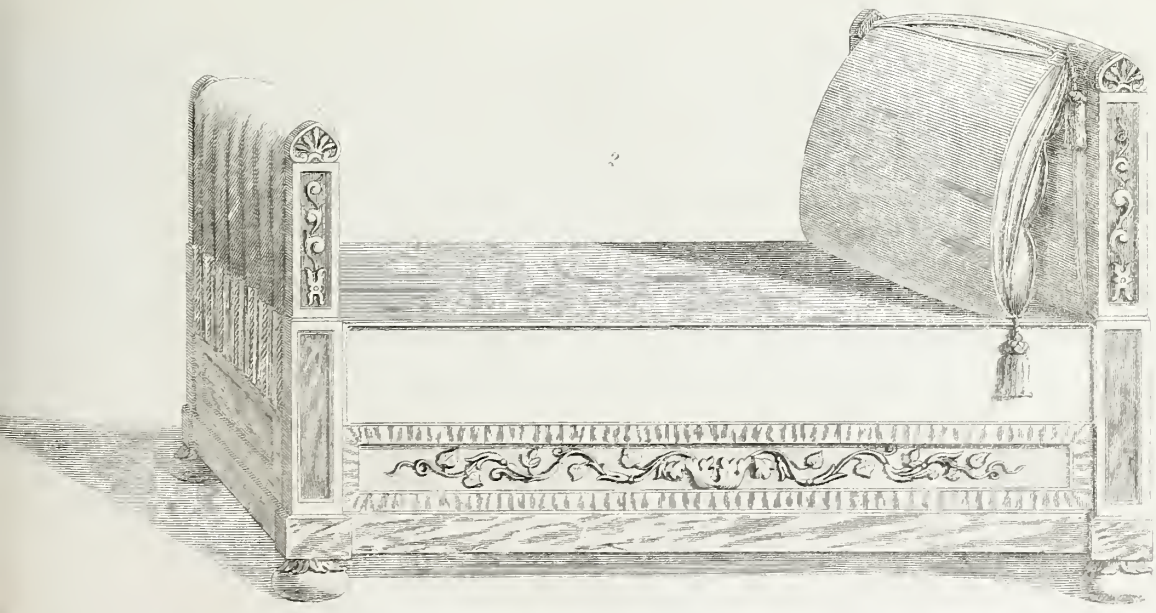
TETE a TETE SEATS.

1

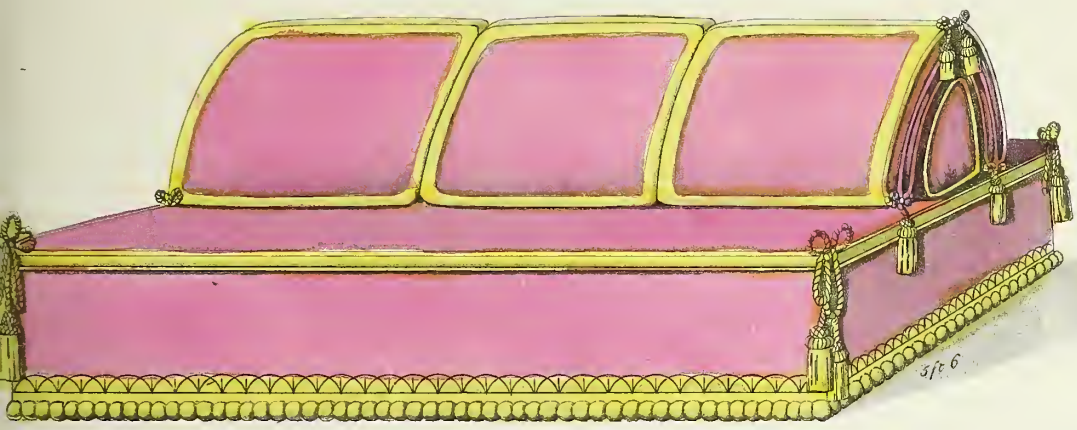


Feet 3 2 1

2

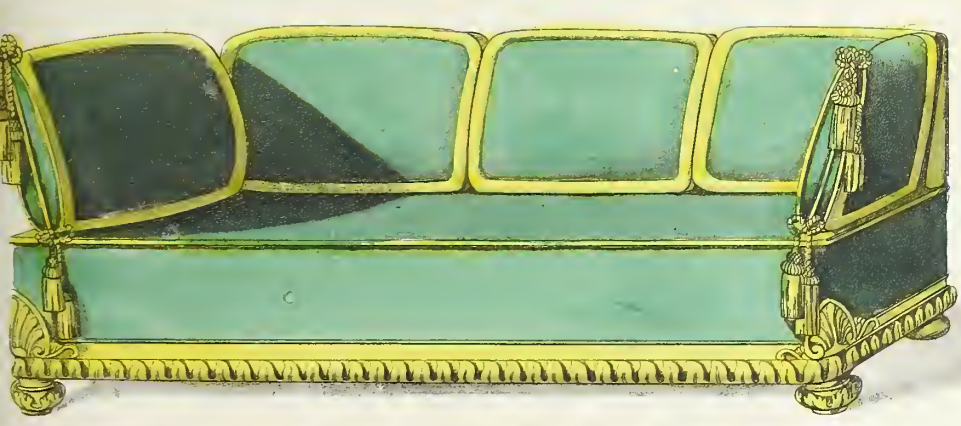


CHANCELIER.

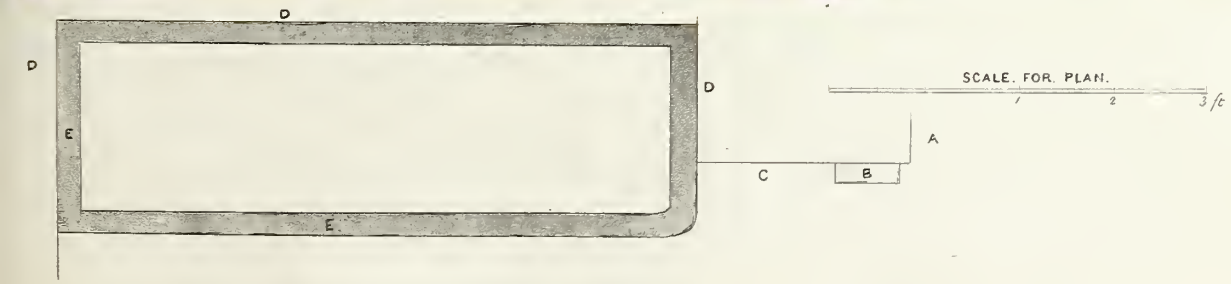


FEET

OTTOMAN. FOR. A. RECESS.



A. CHYMNEY.
B. PILASTER. of CHYMNEY. PIECE.
C. BREAST. of D°.
D.D.D. RECESS.
E.E. FRAME. of. OTTOMAN.



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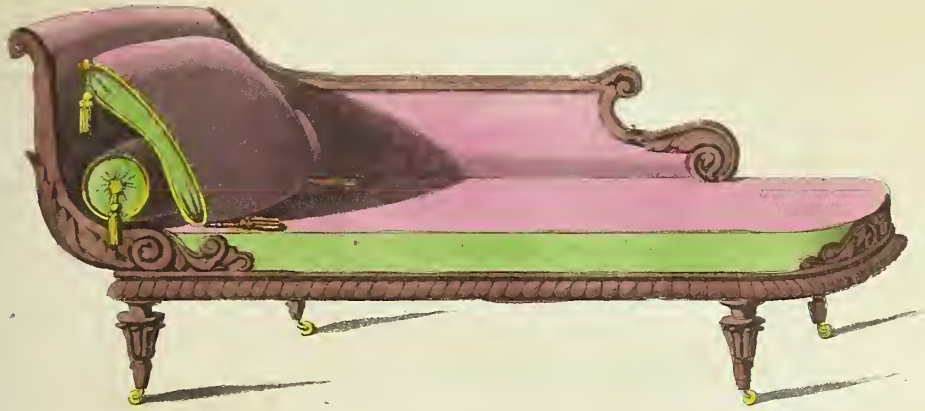
CHAISE . LONGUES.

ORNAMENT. AT. FOOT. ENLARGED



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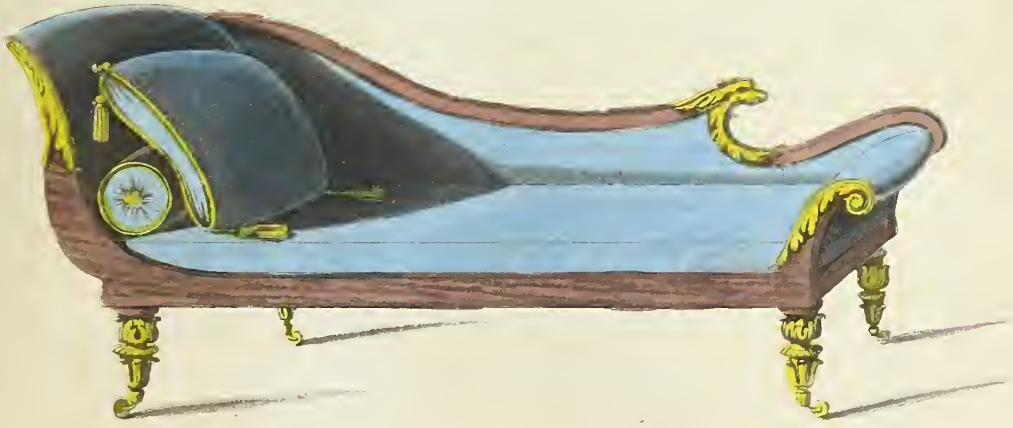
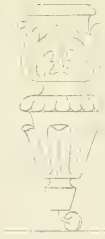


LEG. ENLARGED

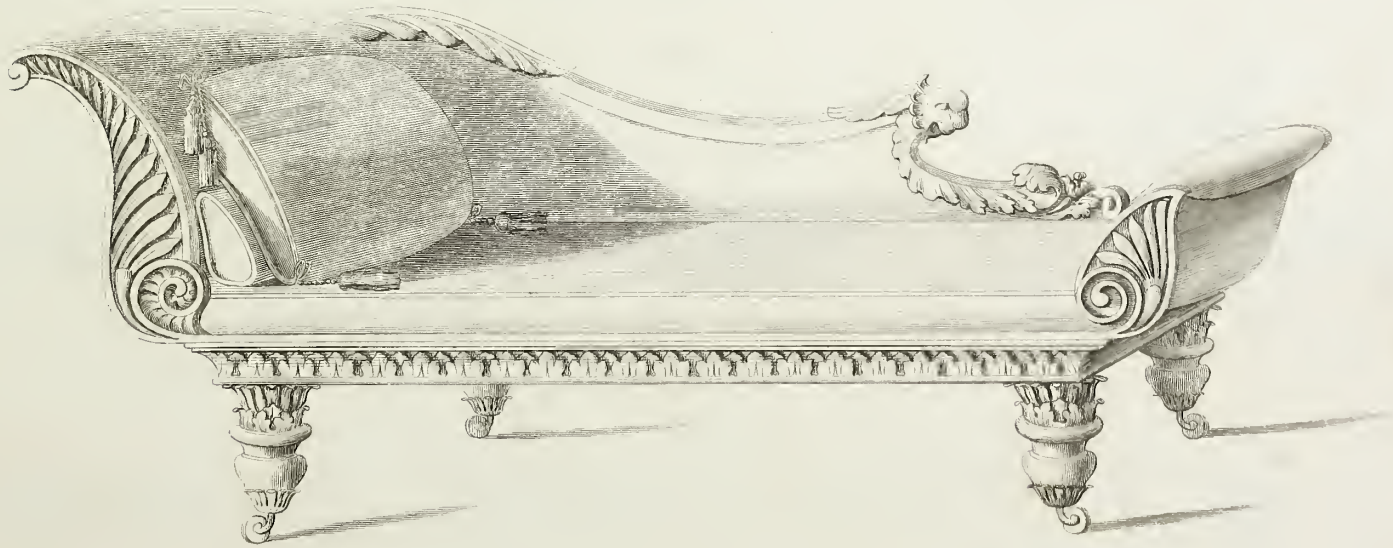


SCALE 4 3 2 1 FOR CHAISE LONGUES.

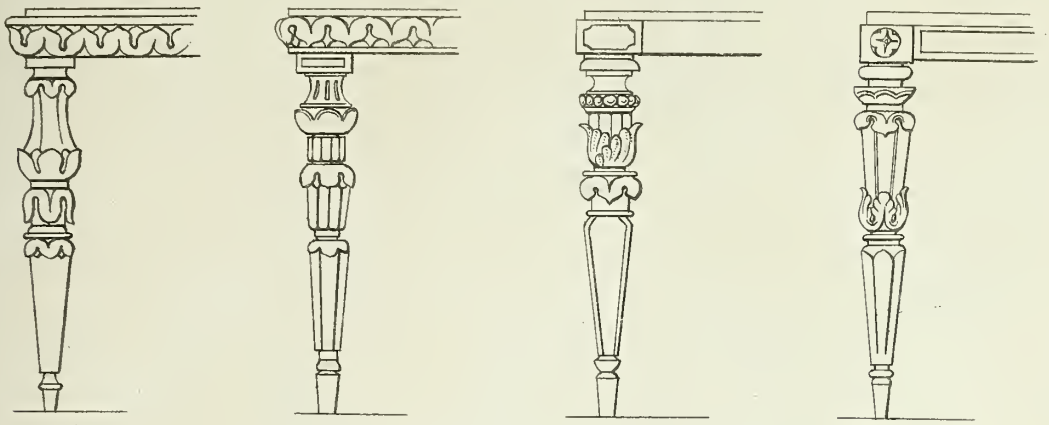
SCALE 1 FOR ENLARGED PARTS.

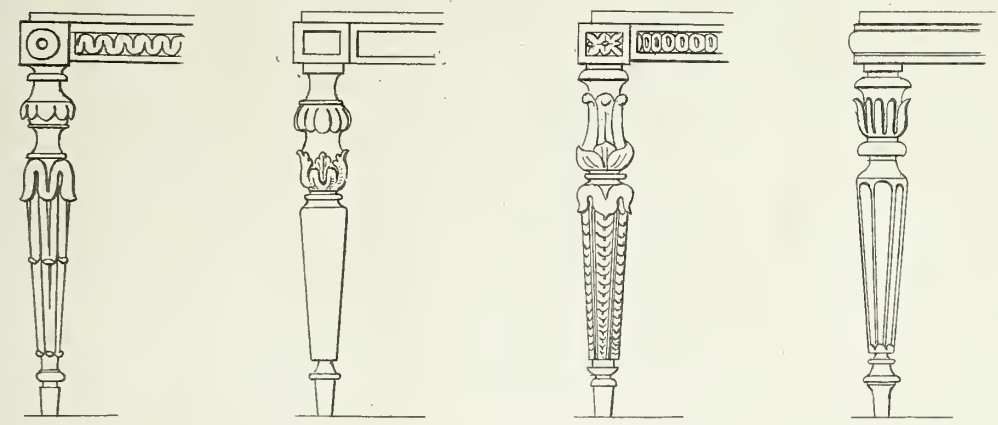
LONDON. Pub[d] by JONES & Co April 22,1826.

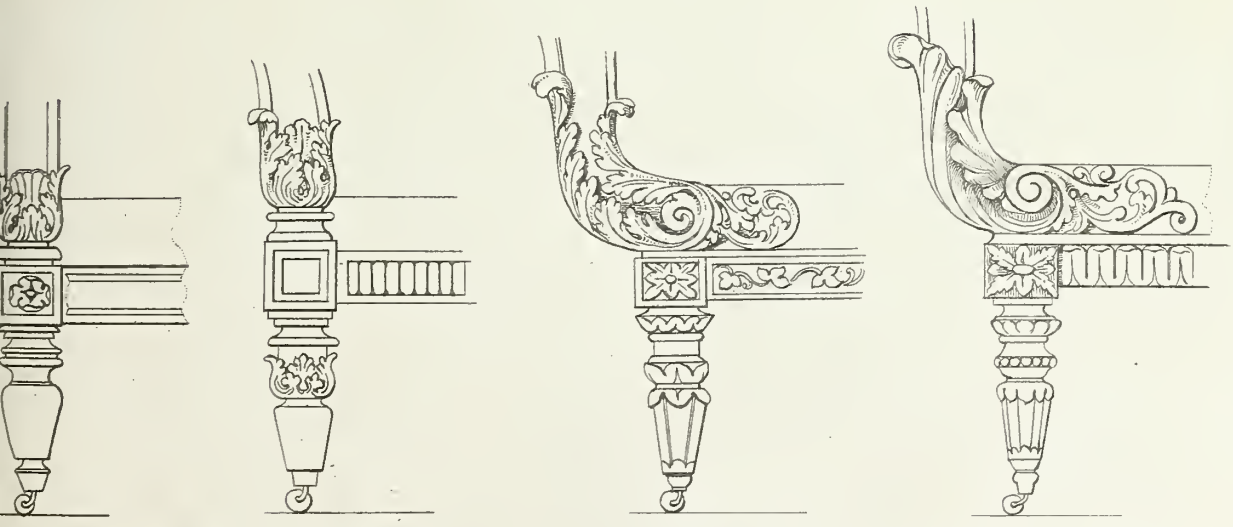
CHAISE LONGUE.



CHAIR LEGS & RAILS.







SOFA FEET & RAILS.

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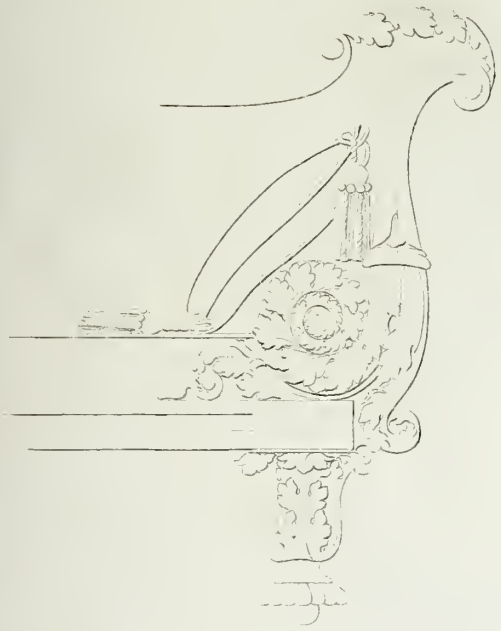
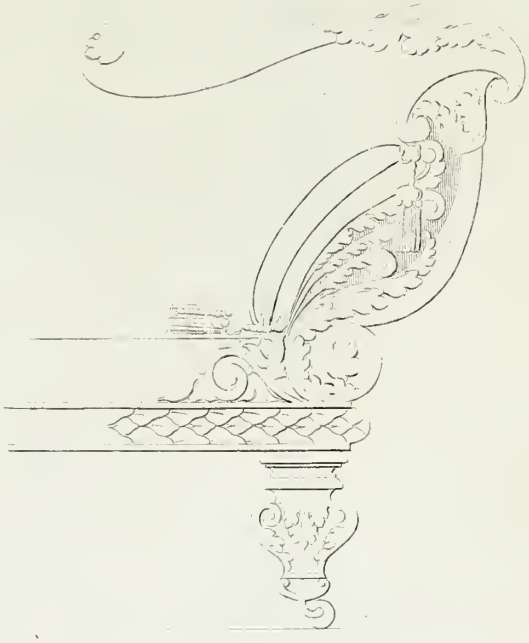
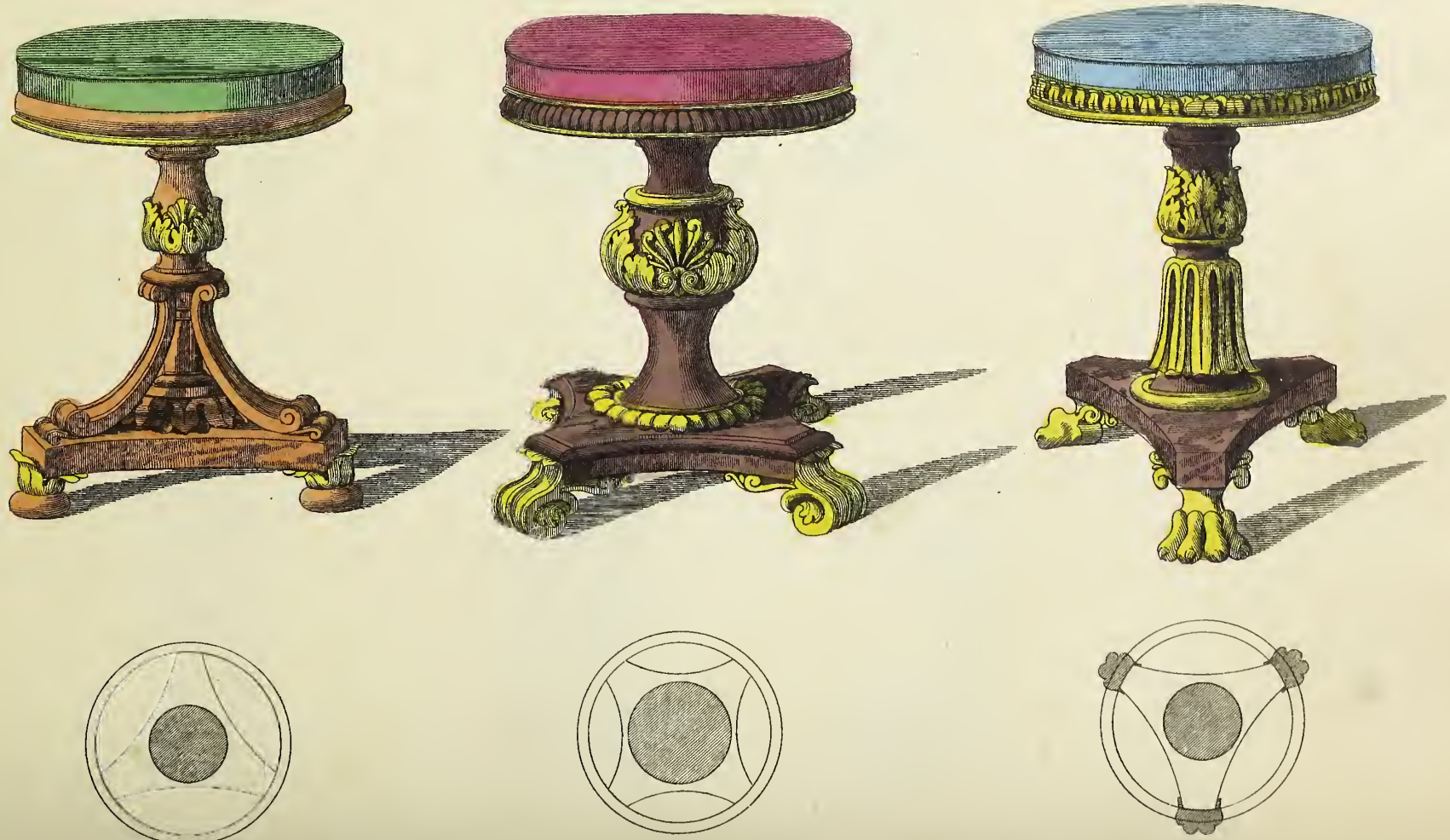
SCROLL END'S for SOFAS.



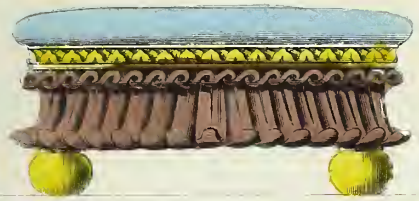


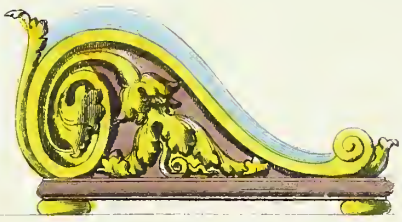
0 1 2 3 Feet

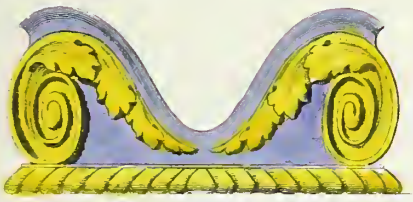
MUSIC STOOLS.

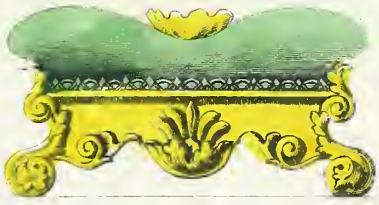


FOOTSTOOLS IN PROFILE.









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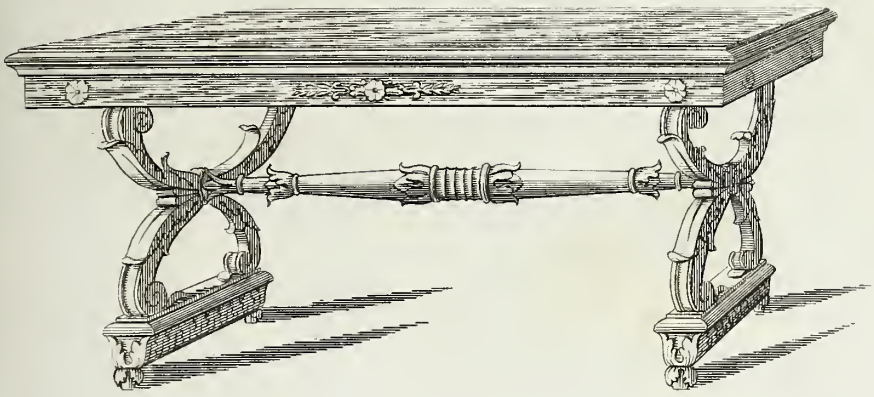
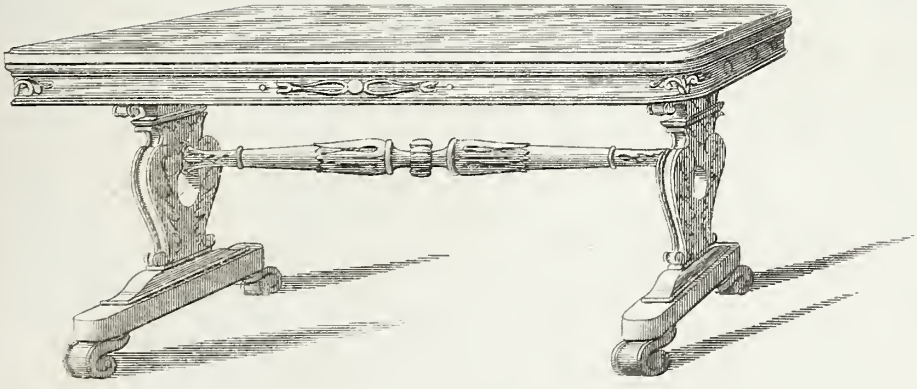
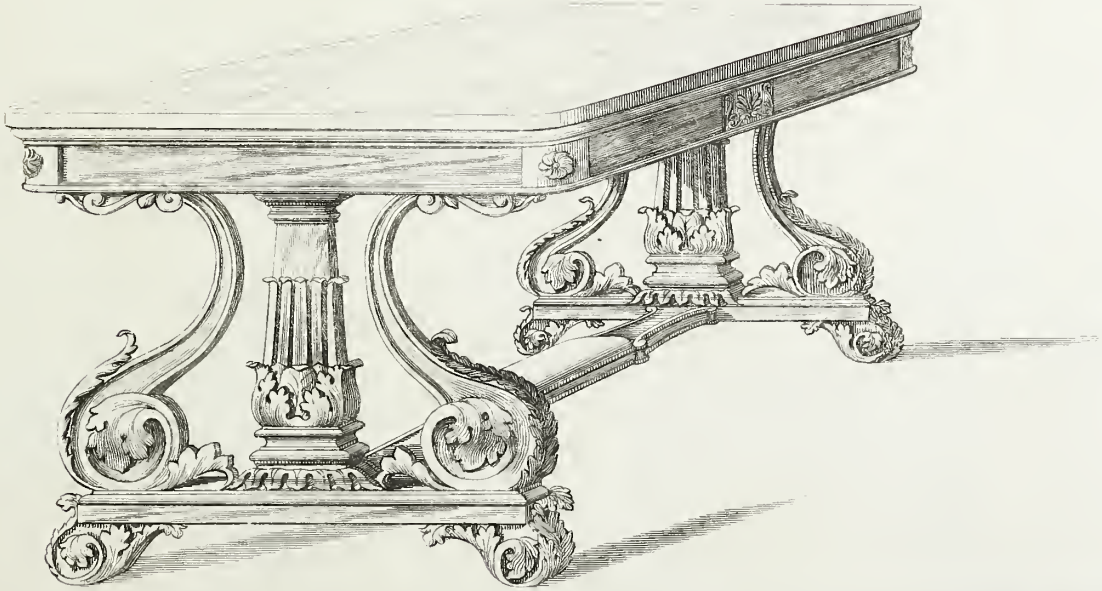
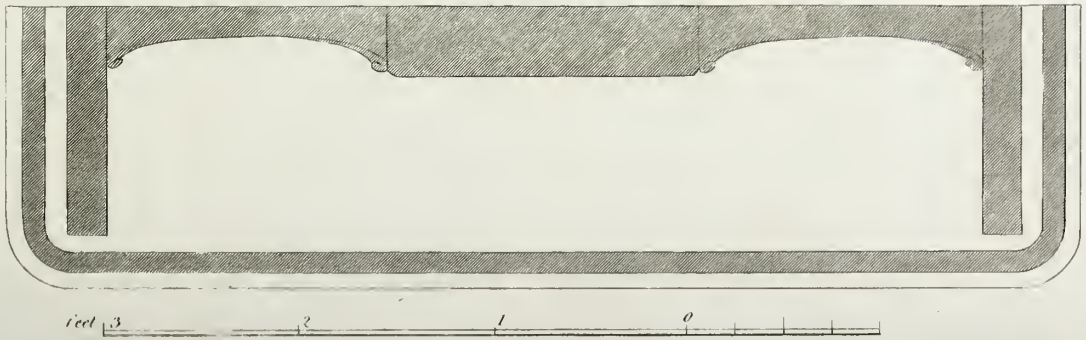
OCCASIONAL TABLES.





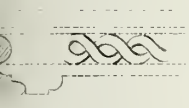
OCCASIONAL TABLE II.

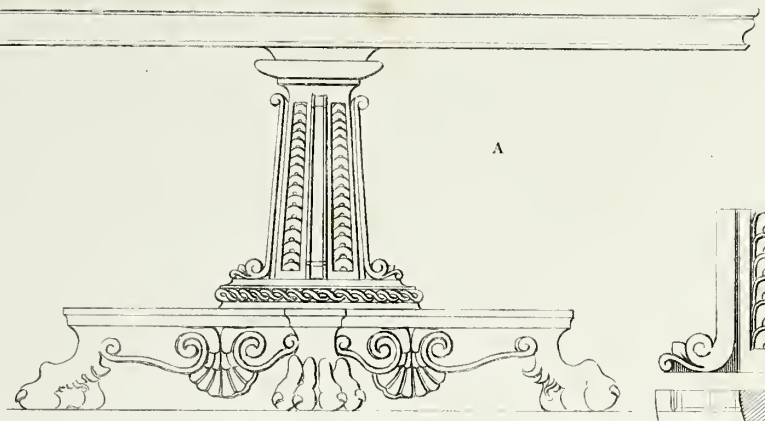




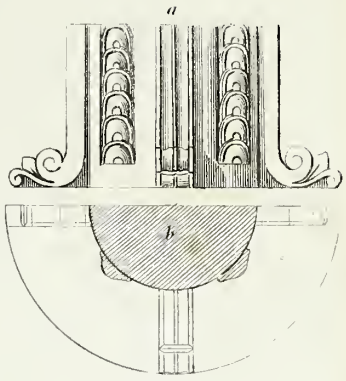
LOO TABLES.

Mouldings of Pillar Enlarg'd.

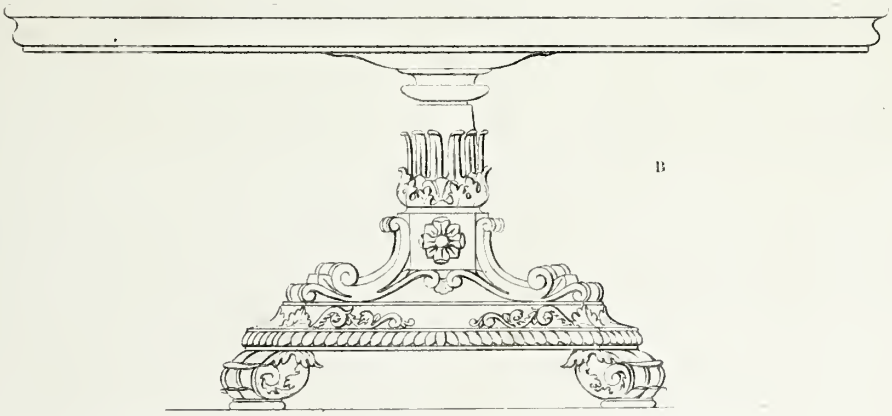




A



a. Part of the Pillar Enlarg'd.
b. Half the Plan of Pillar.



B

Scale for Elevations.

Feet

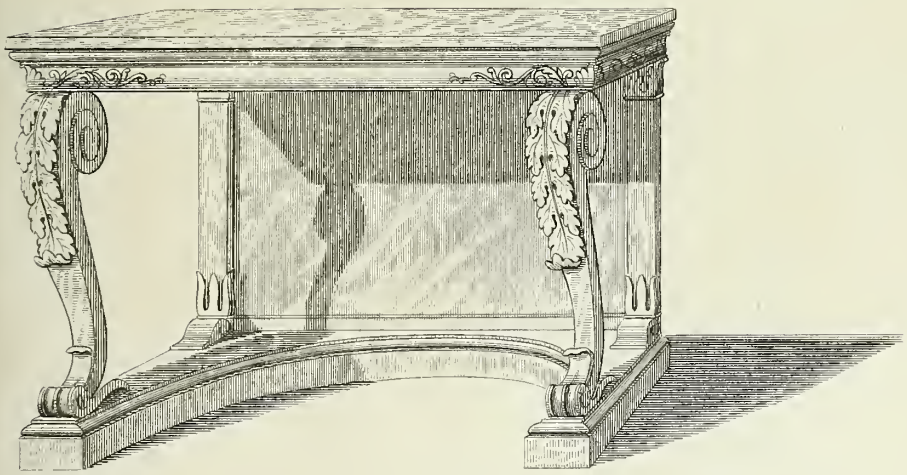
Plan of Table, B.

Plan of Table A on a smaller Scale.

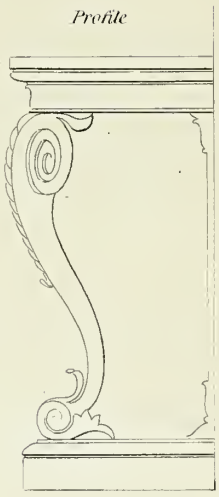
Scale for Plans

Feet.

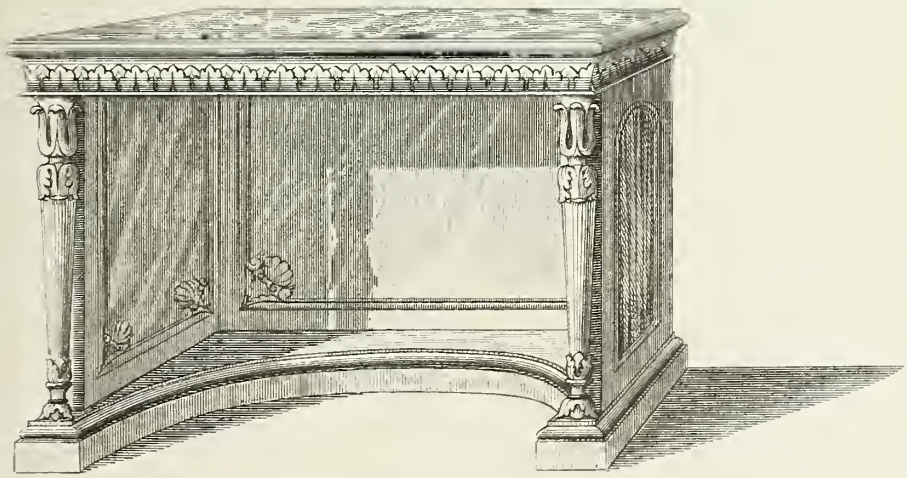
PIER TABLES.



Profile



for both Tables.



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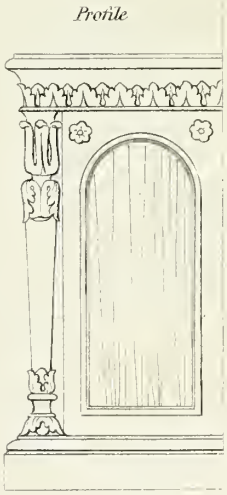

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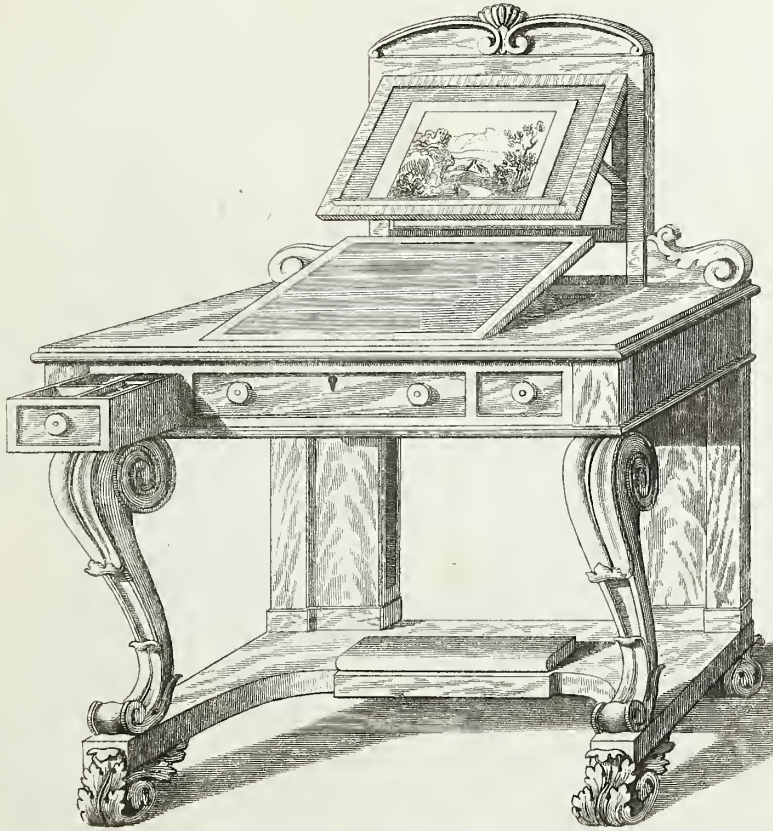
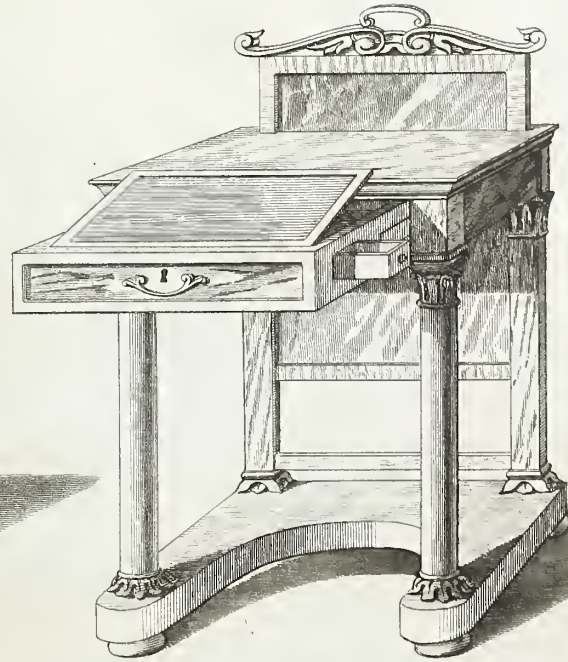
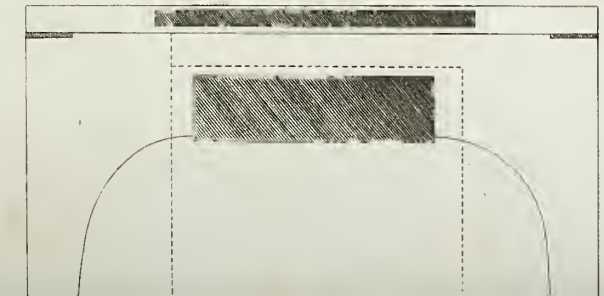
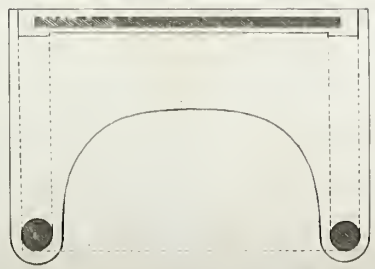
LADIES DRAWING TABLE.



LADIES SCREEN WRITING TABLE.

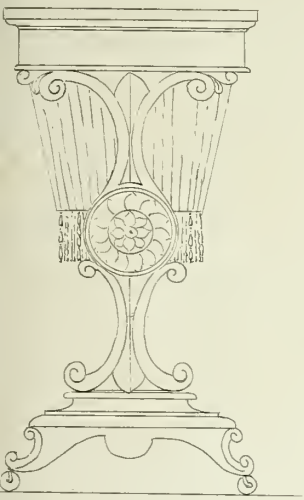


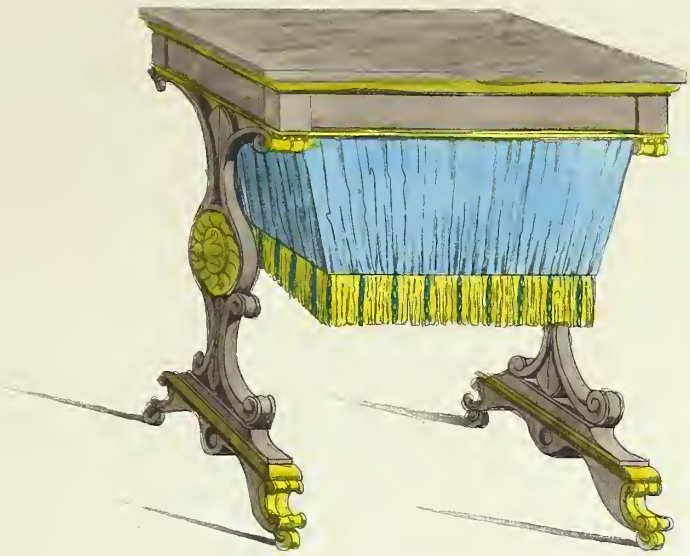


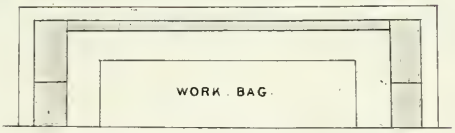


LADIE'S . WORK . TABLE.

PROFILE.

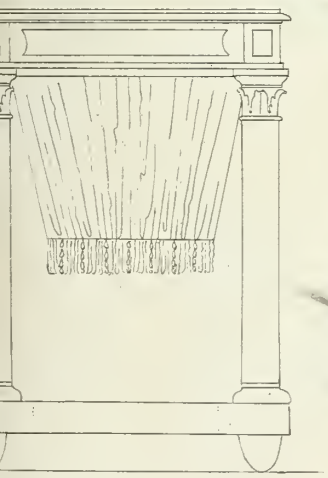


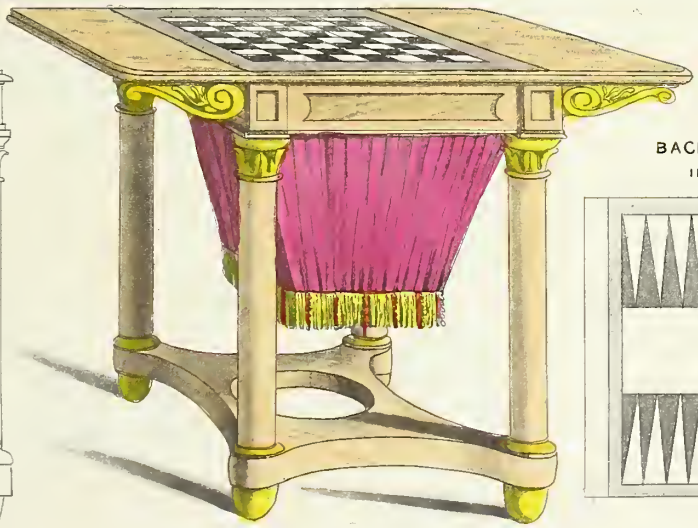




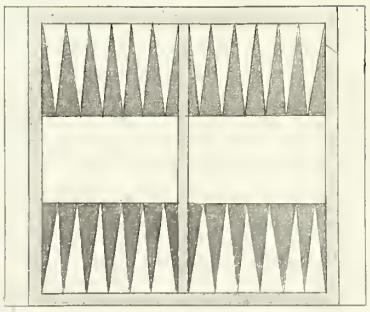
BACKGAMMON . WORK . TABLE.

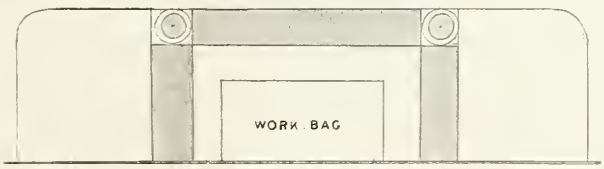
PROFILE.





BACKGAMMON . BOARD.
INSIDE OF TABLE.





Scale 4 3 2 1 Feet

E. South.

London, Published by Jones & C° April 22,1826

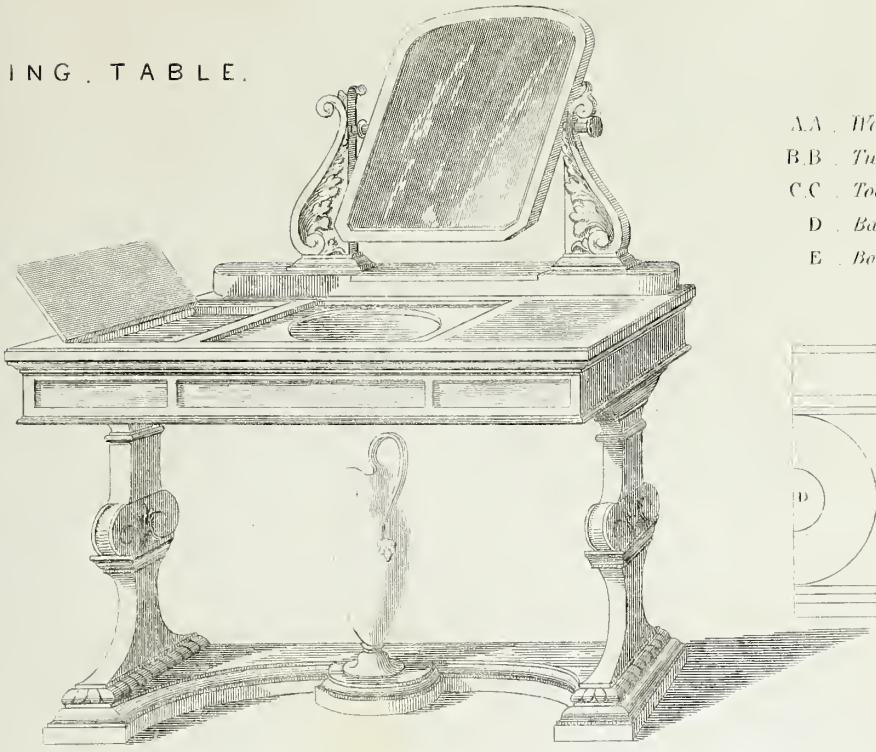
FRENCH SECRETAIRE.

Scale for Secretaire.

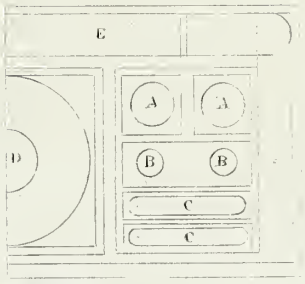
DEJUNÉ TABLE.

Scale for Table.

DRESSING TABLE.

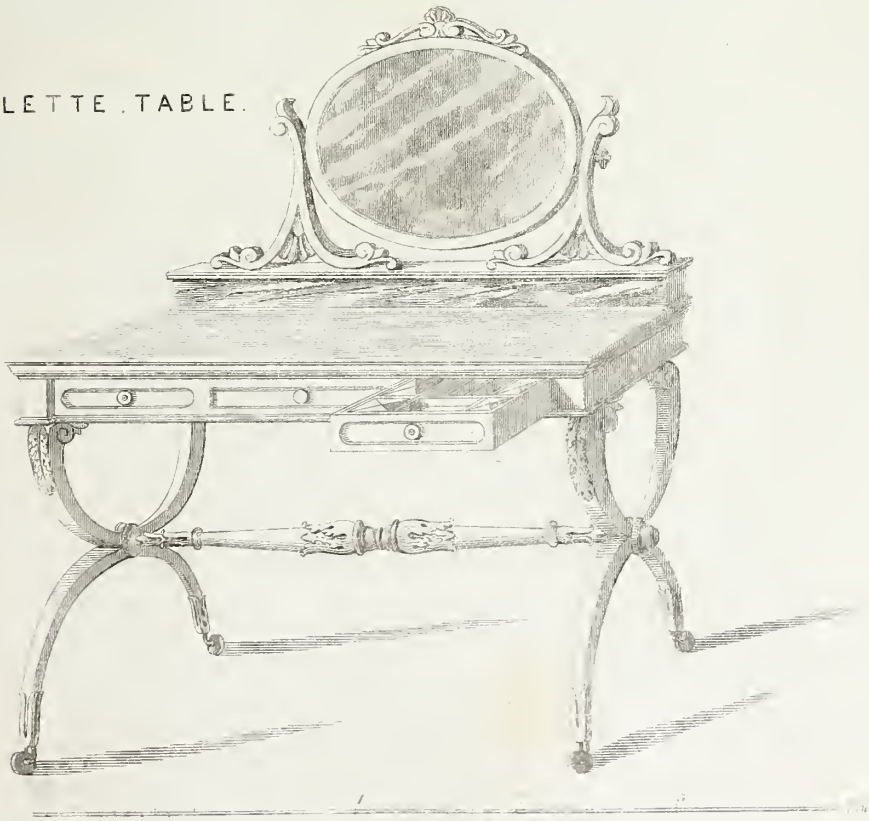


A.A . *Water Carafes.*
B.B . *Tumblers.*
C.C . *Tooth Brush Trays.*
D . *Bason.*
E . *Box under the Glass.*

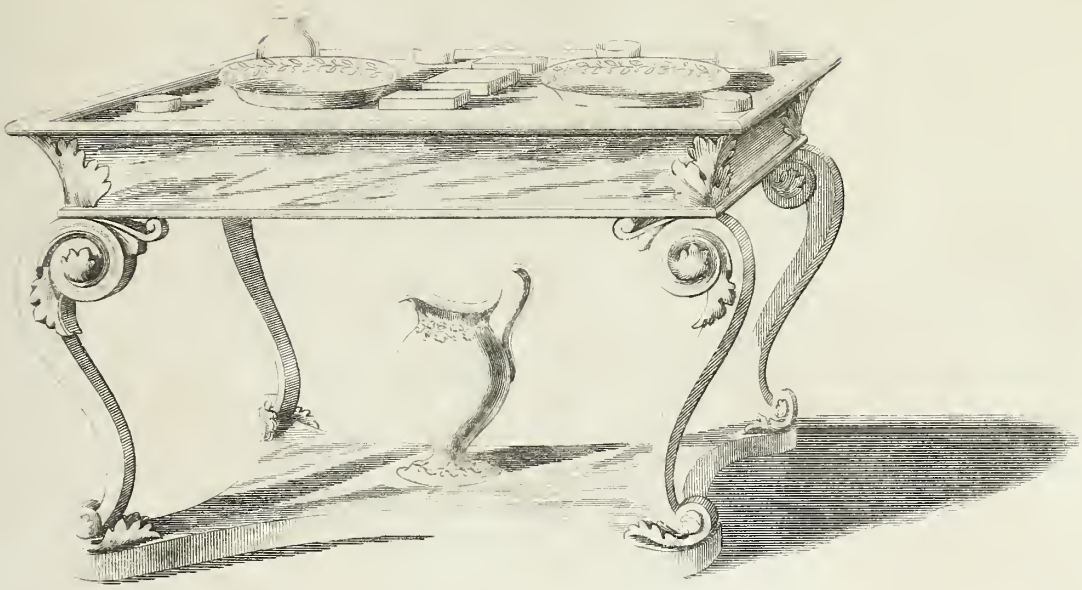


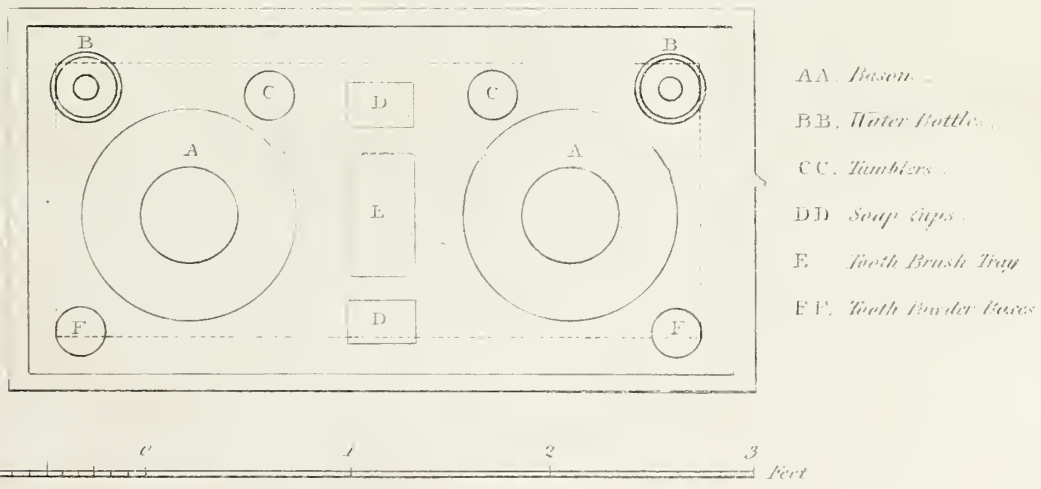
½ *Plan of Top.*

DIES TOILETTE TABLE.



WASH HAND TABLE.





AA. *Basons*.

BB. *Water Bottles*.

CC. *Tumblers*.

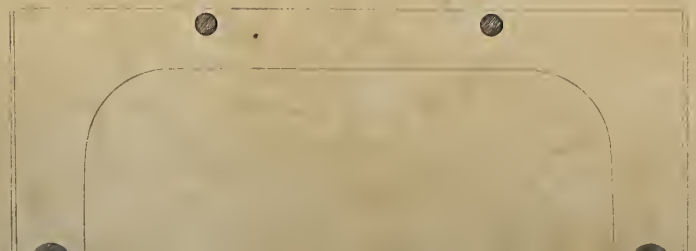
DD. *Soap Cups*.

E. *Tooth Brush Tray*

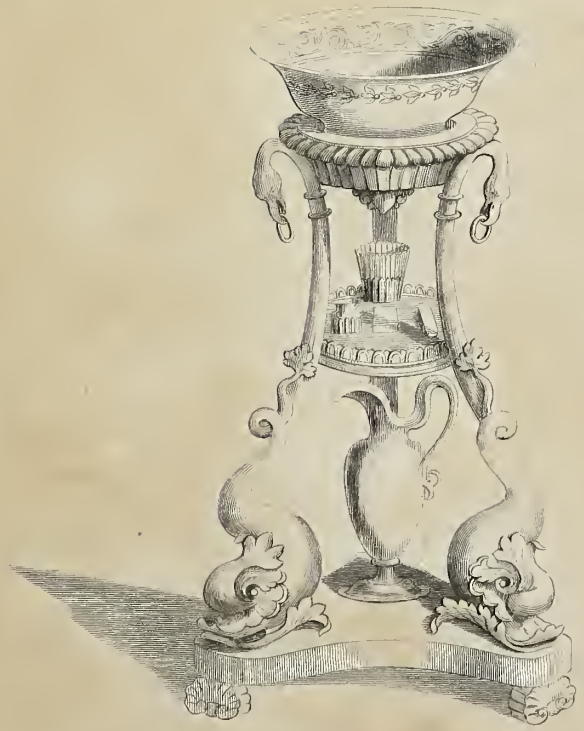
FF. *Tooth Powder Boxes*

LADIES DRESSING TABLE.

Wash Hand Stand.

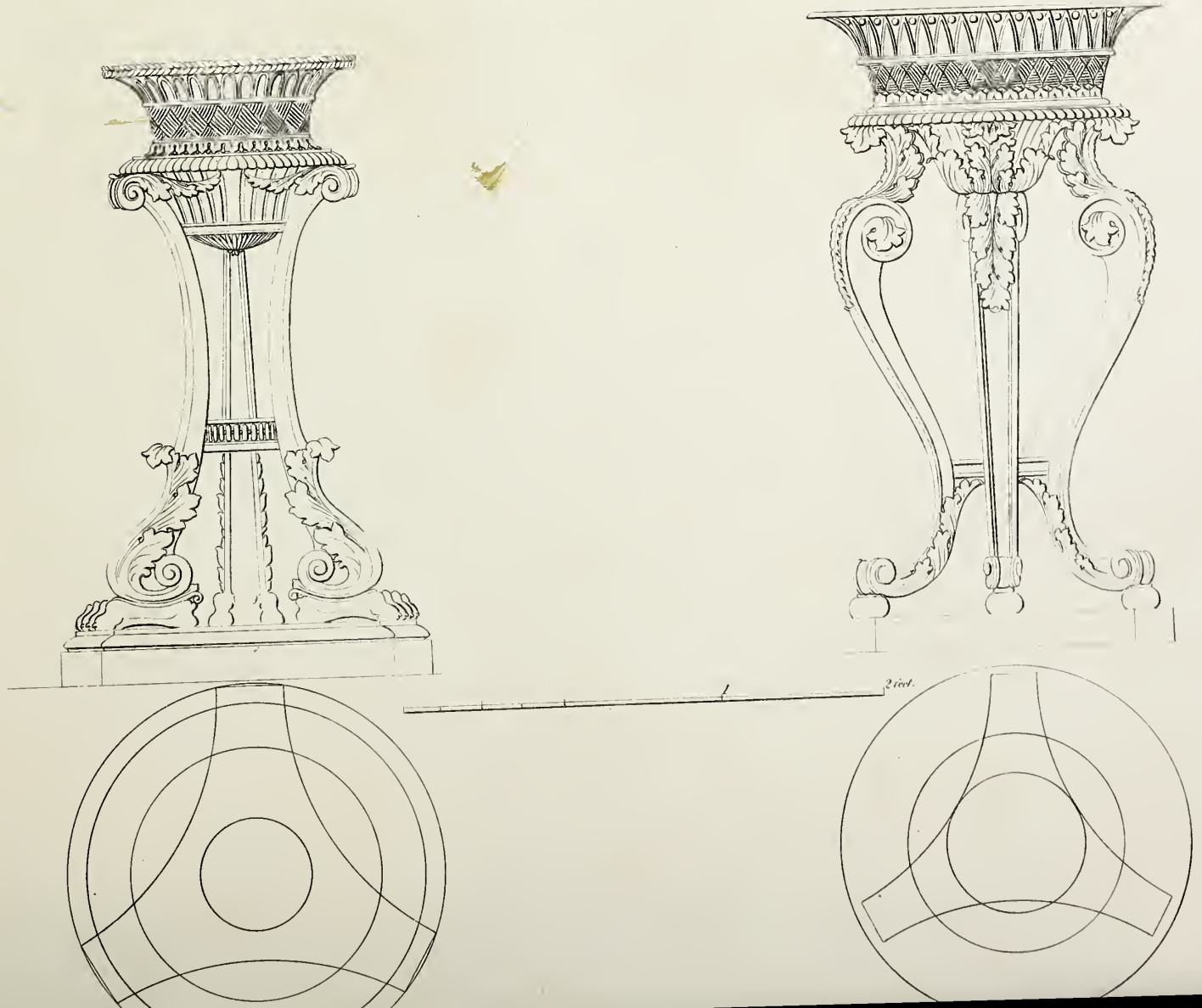


BASON STANDS.

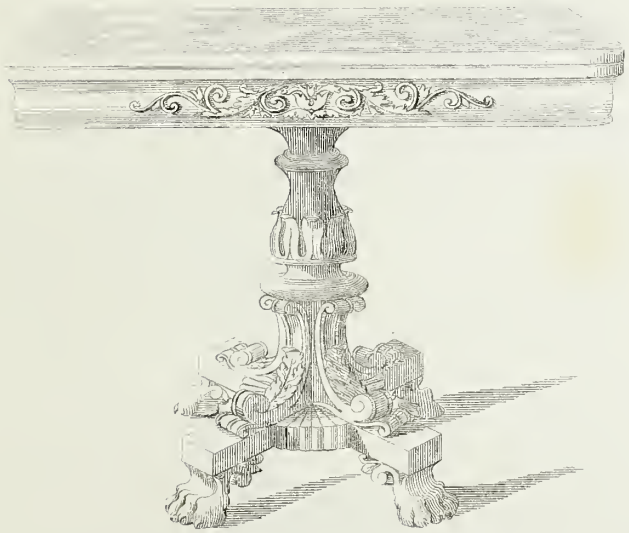


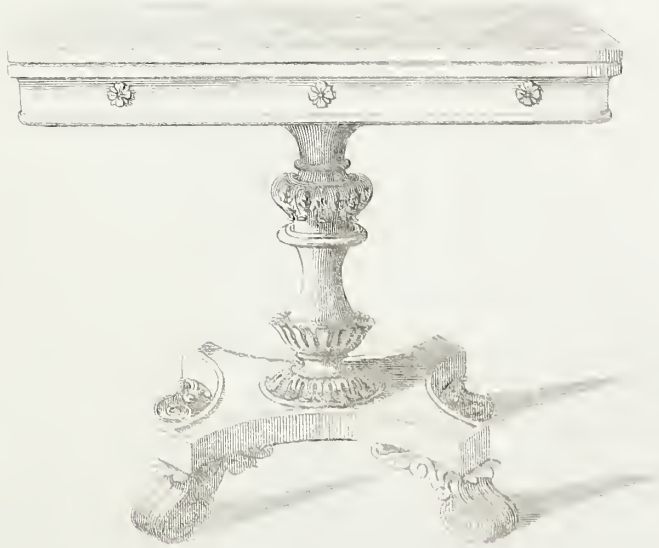
1 2 3 feet.

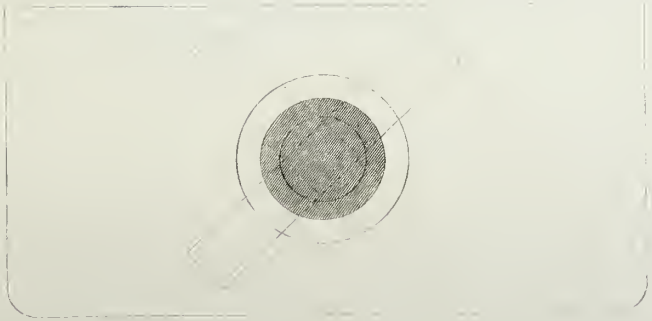
TRIPOD STANDS, FOR FLOWER BASKETS.

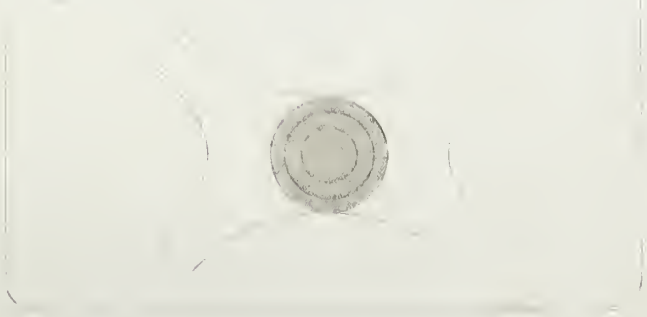


CARD TABLES.

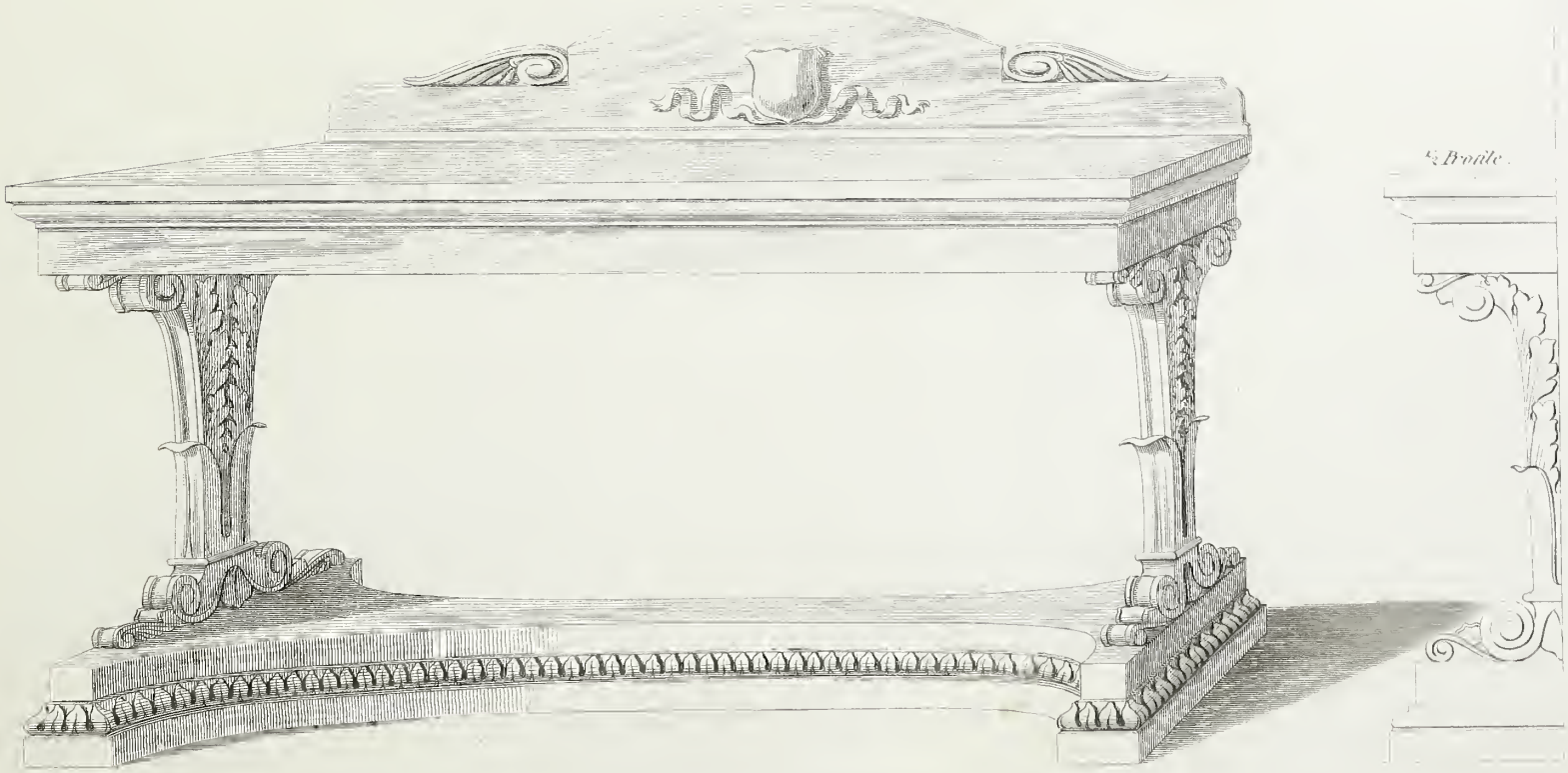








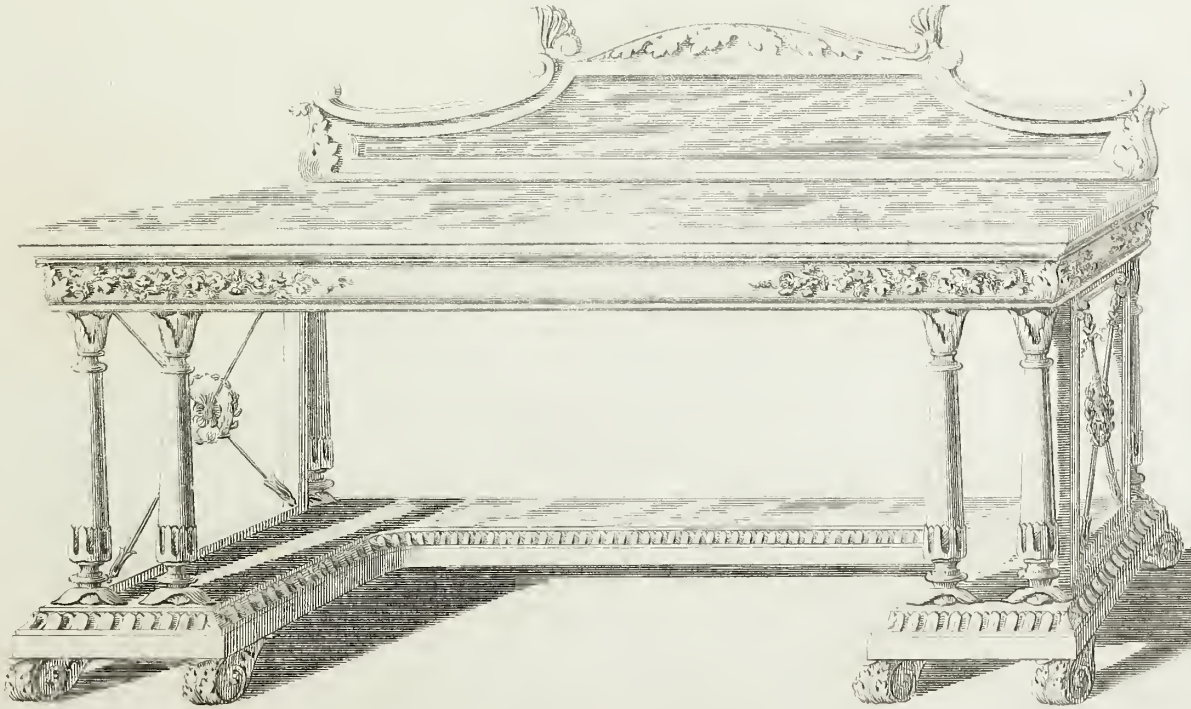
HALL TABLE.



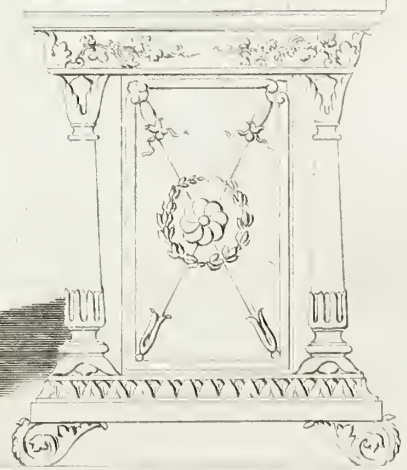
½ Profile.

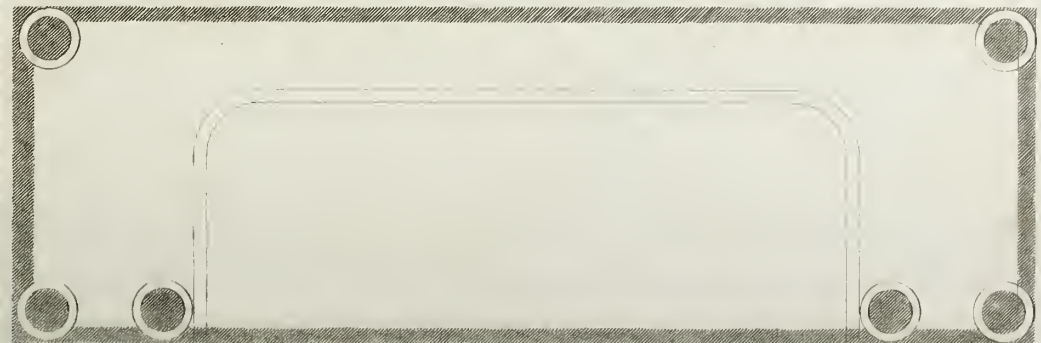
Feet 3 2 1

TABLE SIDEBOARD.



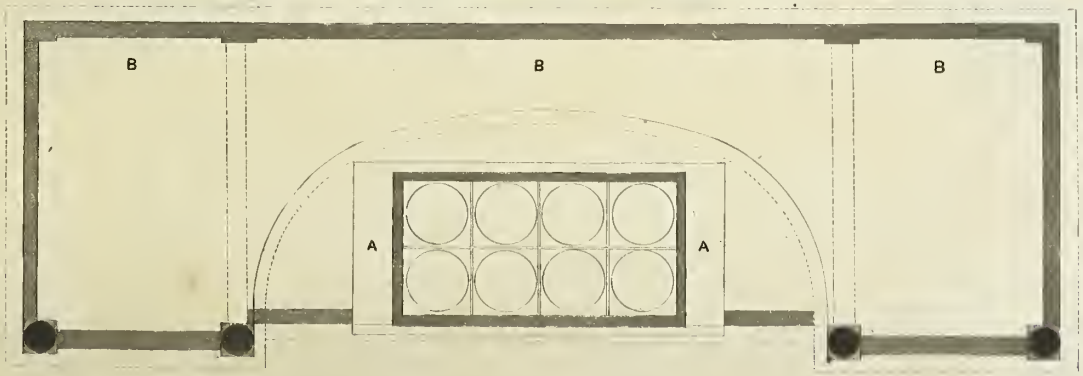
Profile.





SIDEBOARD. CELLARET. AND. PEDESTALS.

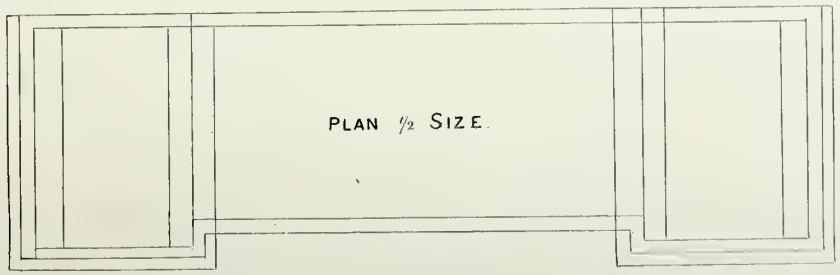
C



SCALE 1 2 3 4 5 6 FEET

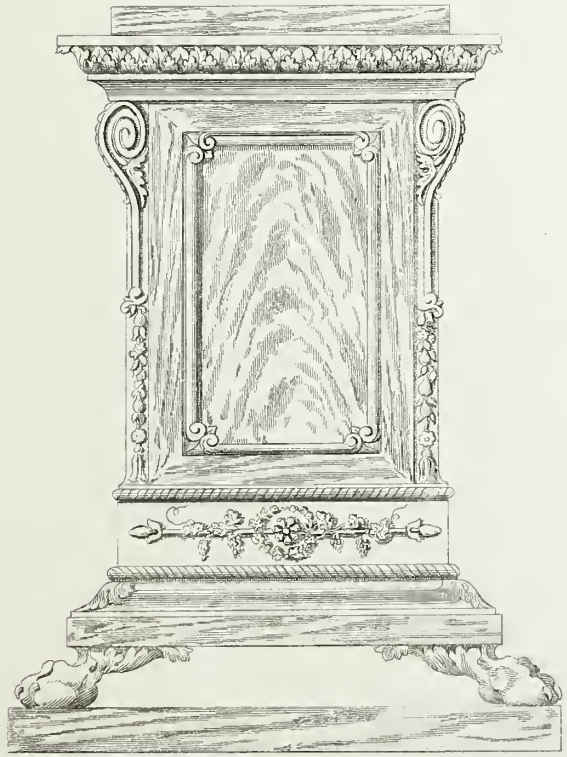
C

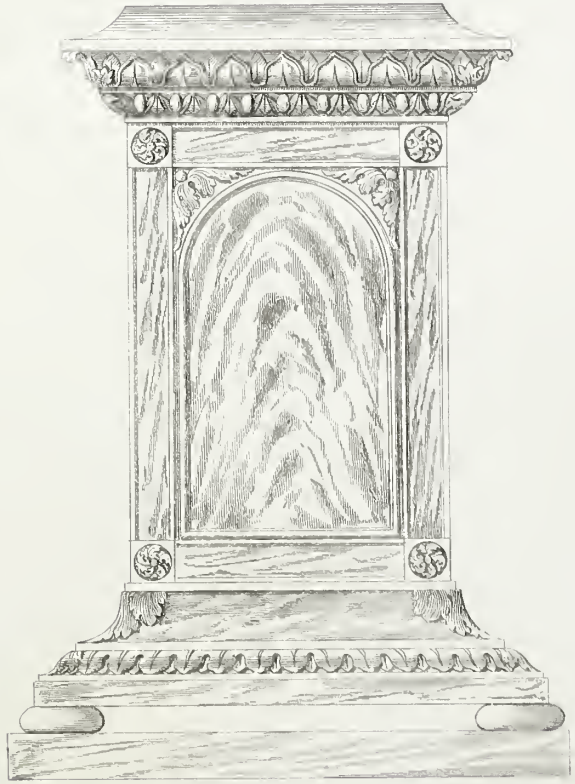
PEDESTAL. SIDEBOARD. AND WINE. COOLER.

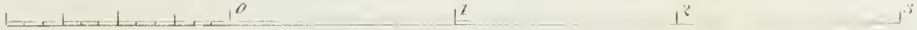


PLAN ½ SIZE.

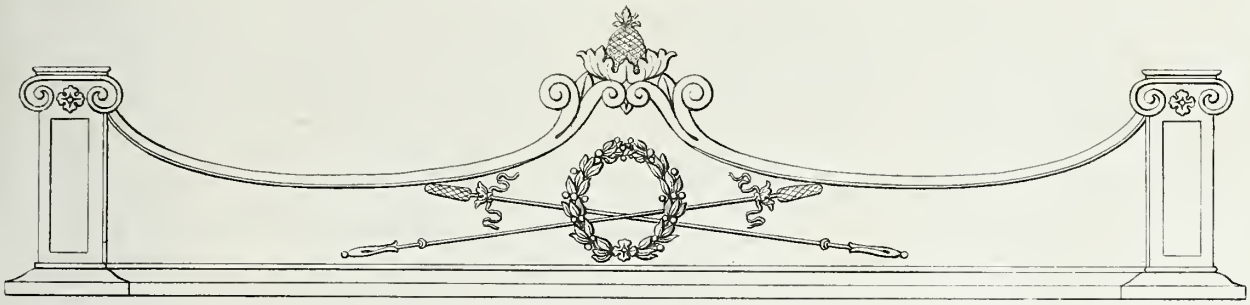
PEDESTALS FOR SIDEBOARD TABLES.

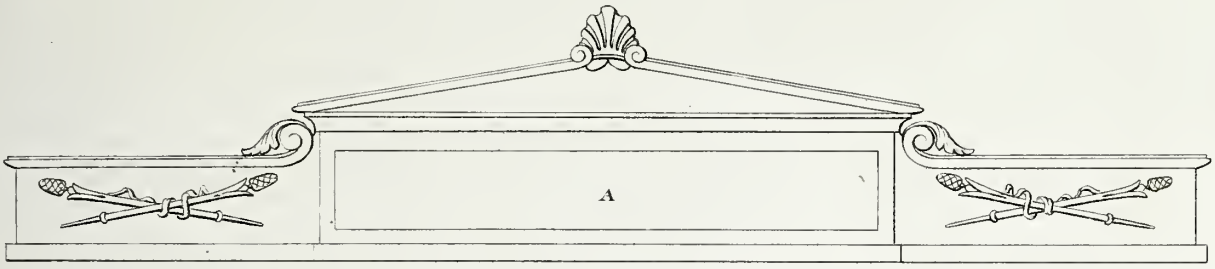


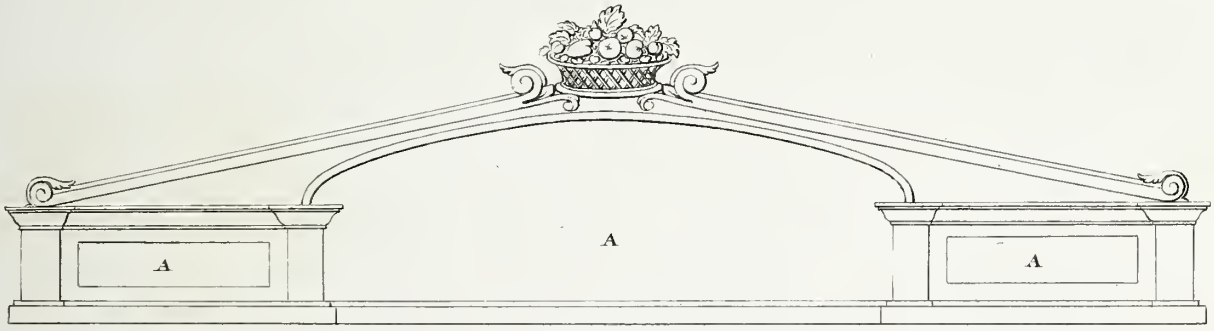


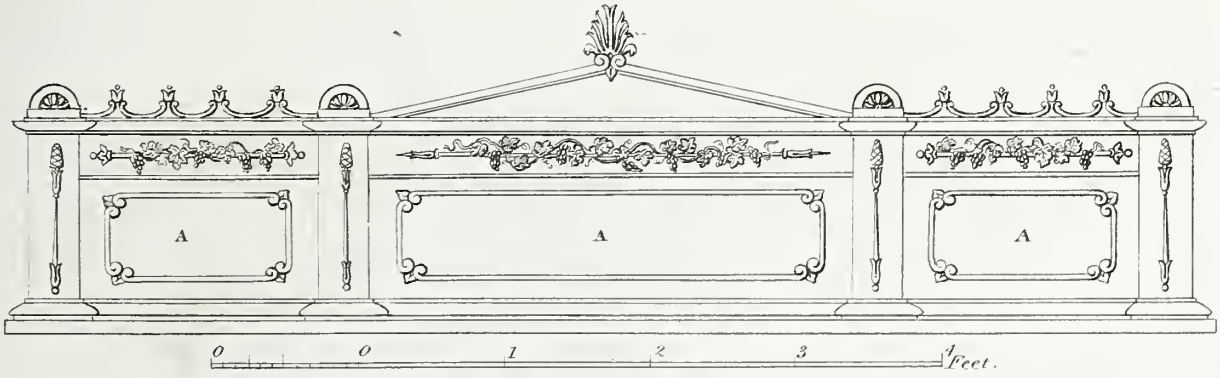


SIDEBOARD BACKS.





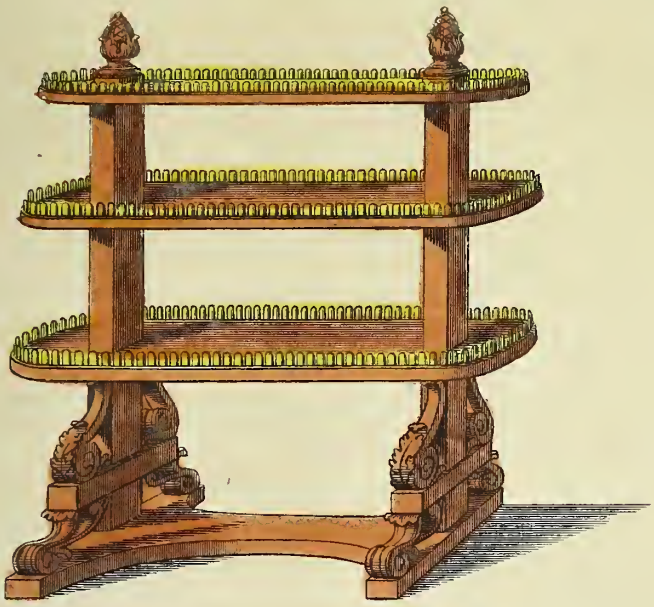




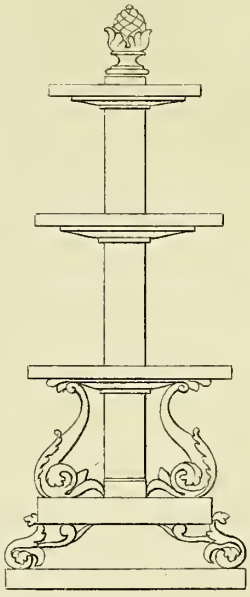
The Parts mark'd A are Looking Glass.

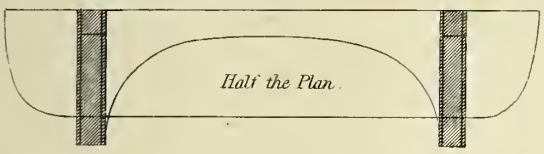
London Published by Jones & Co Sept 1826

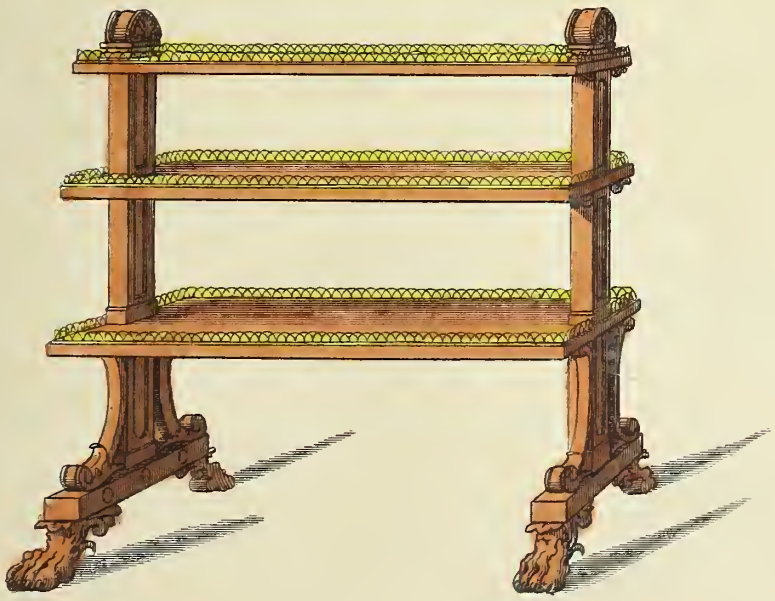
RUNNING SIDEBOARDS.



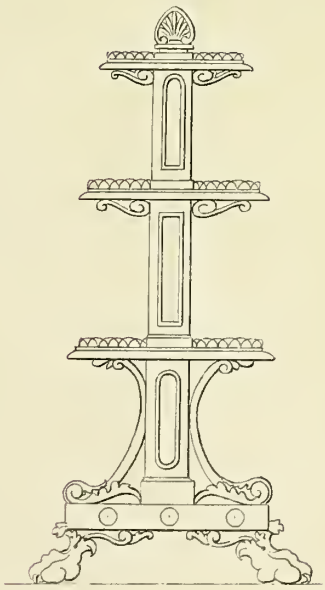
Profile.

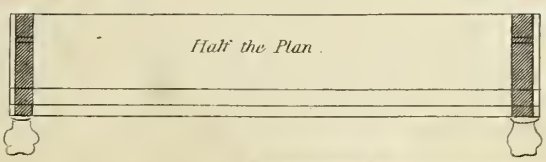






Profile.



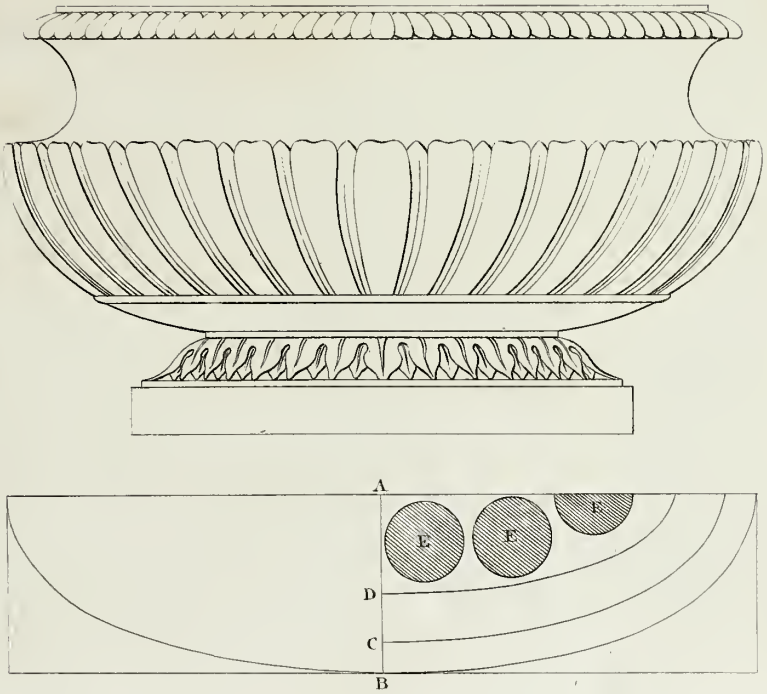


Scale 1 2 3 4 5 Feet

London Published by Jones & C[illegible] e [illegible] 1826

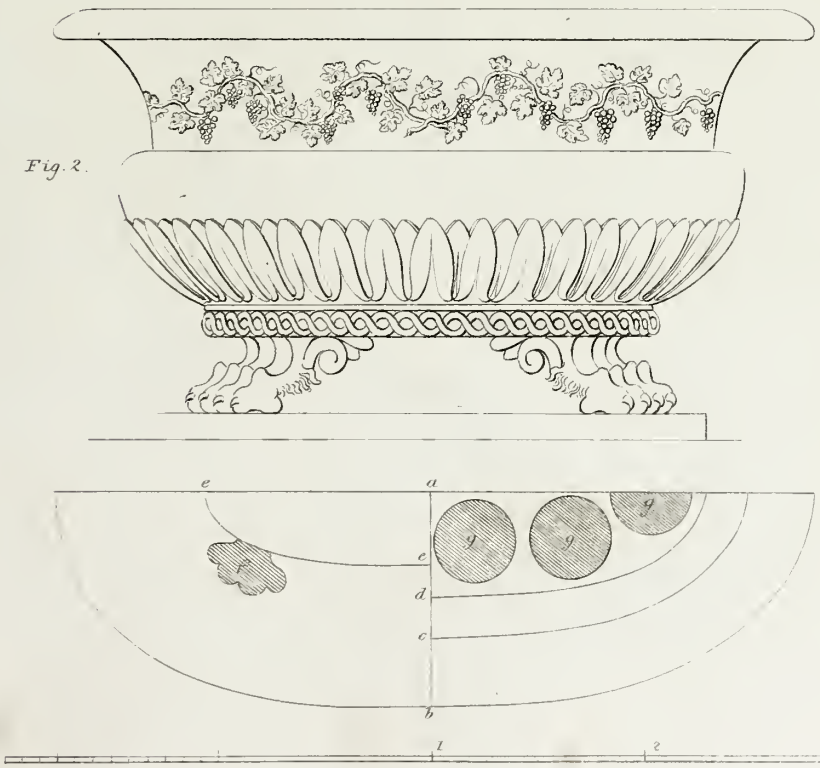
WINE . COOLERS . AFTER . THE . ANTIQUE.

Fig. 1.

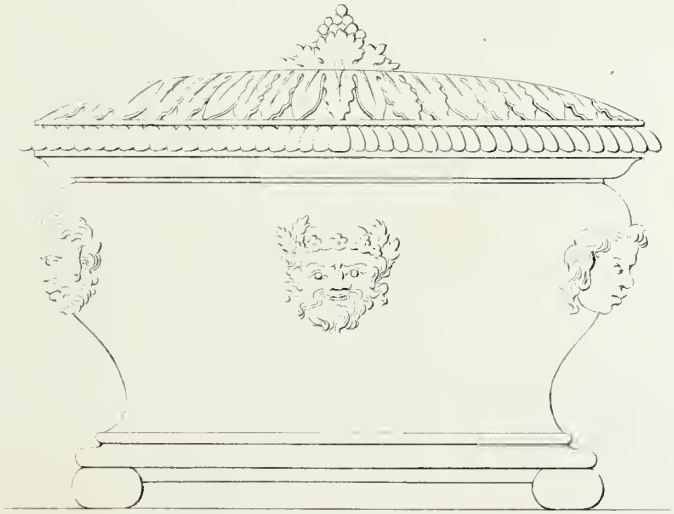


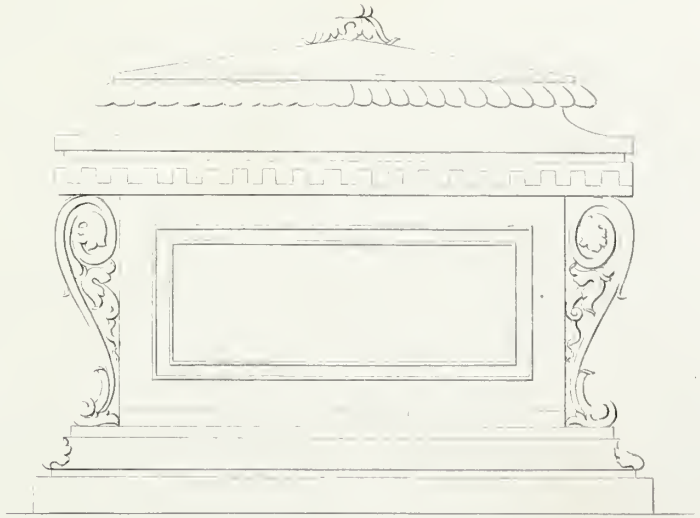
A. *Half Plan.*
B. *Plan of Belly.*
C. *Plan of Neck.*
D *Plan of Bottom.*
EEE. *Bottles.*

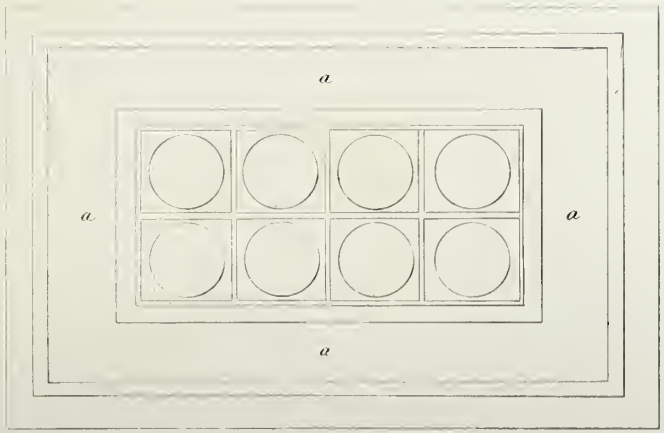
Fig. 2.

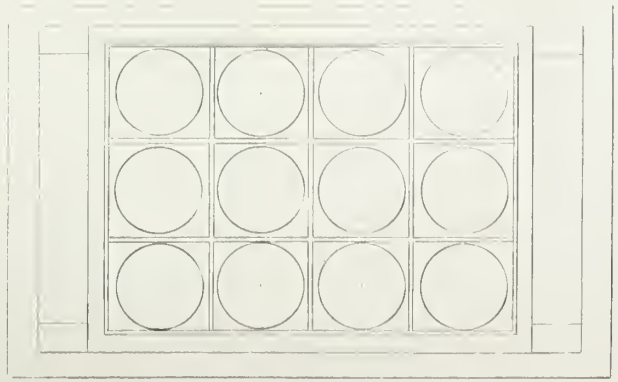


CELLARETS.



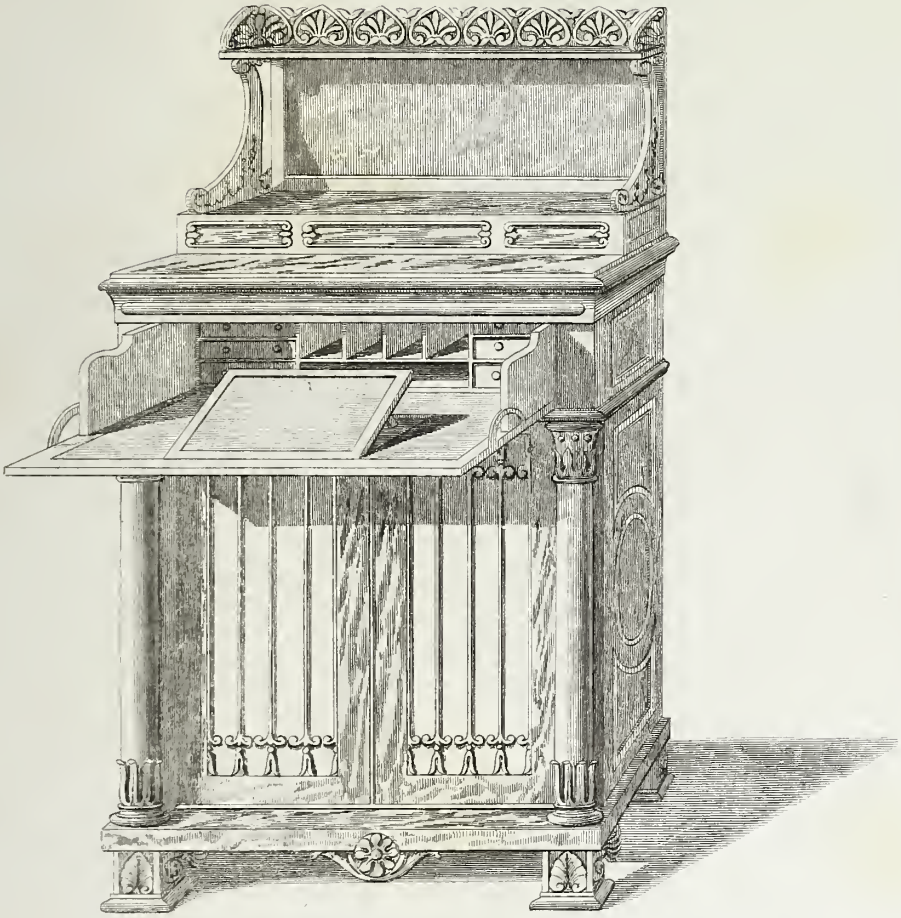


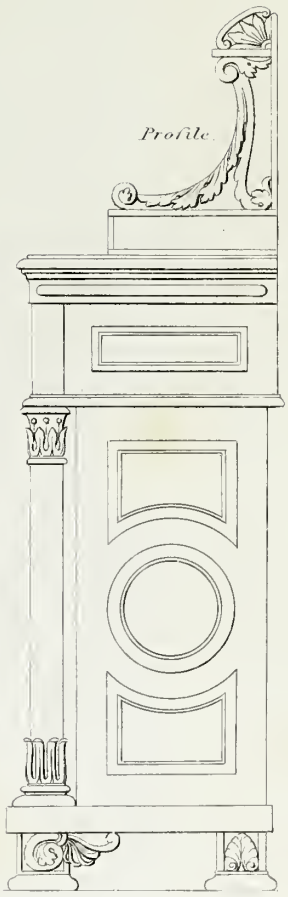


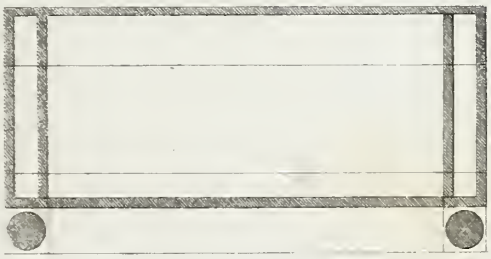


Feet 3 2 1 0

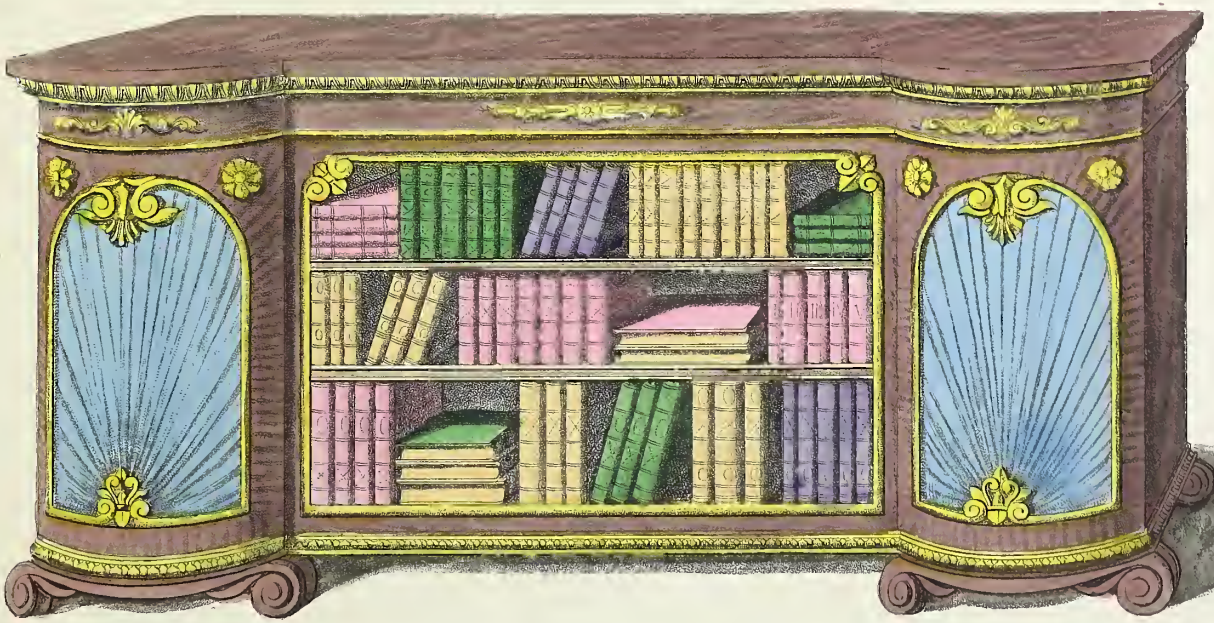
LADIES SECRETAIRE.



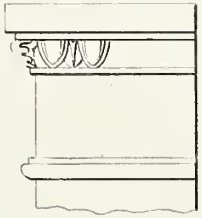




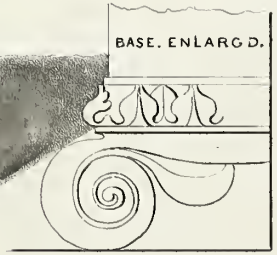
DRAWING · ROOM · COMMODE.

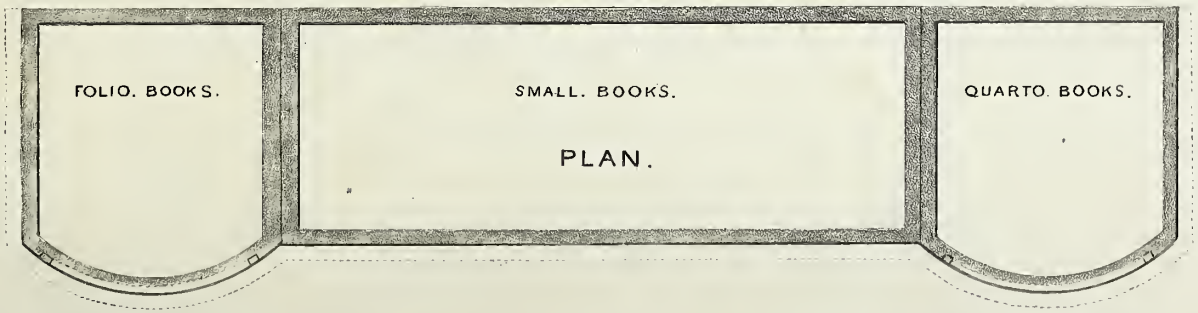


ENLARGD-PROFILE OF UPPER PART.



BASE. ENLARGD.





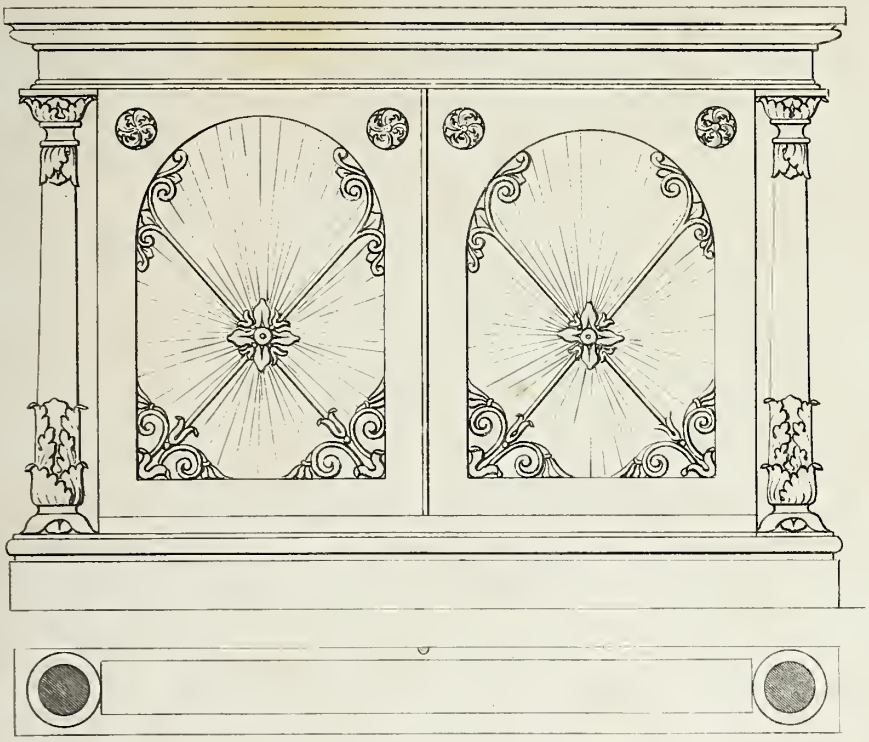
PLAN.

SCALE TO PLAN 1 2 3 FEET

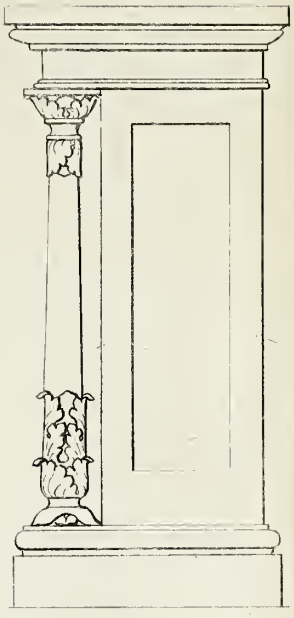
SCALE TO ENLARG'D PARTS

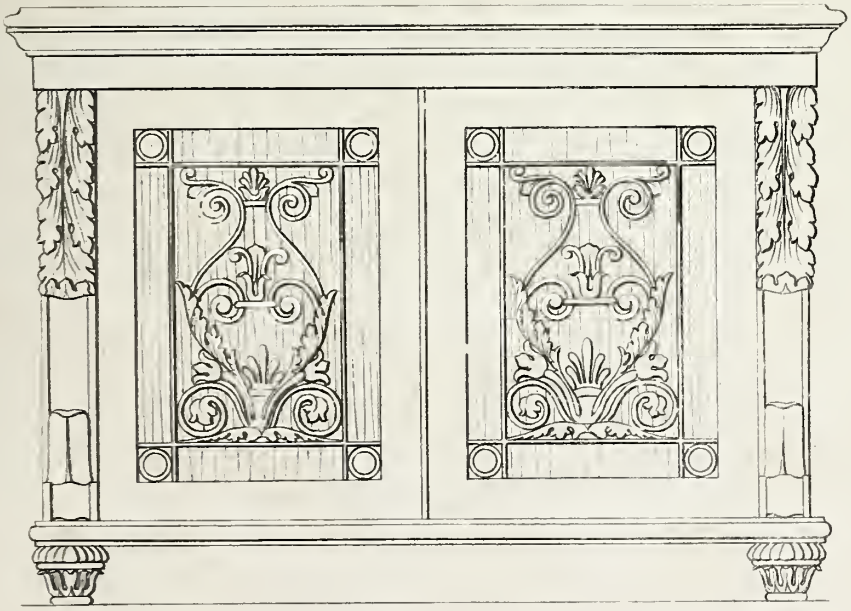
DRAWING ROOM COMMODE.

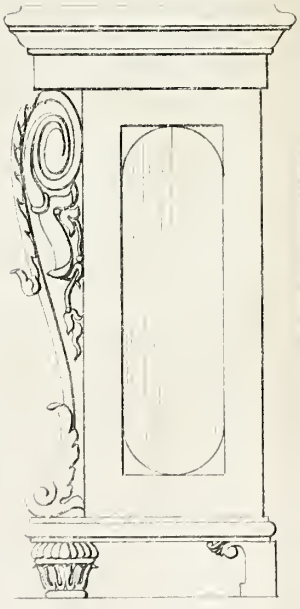
Front.



Profile.



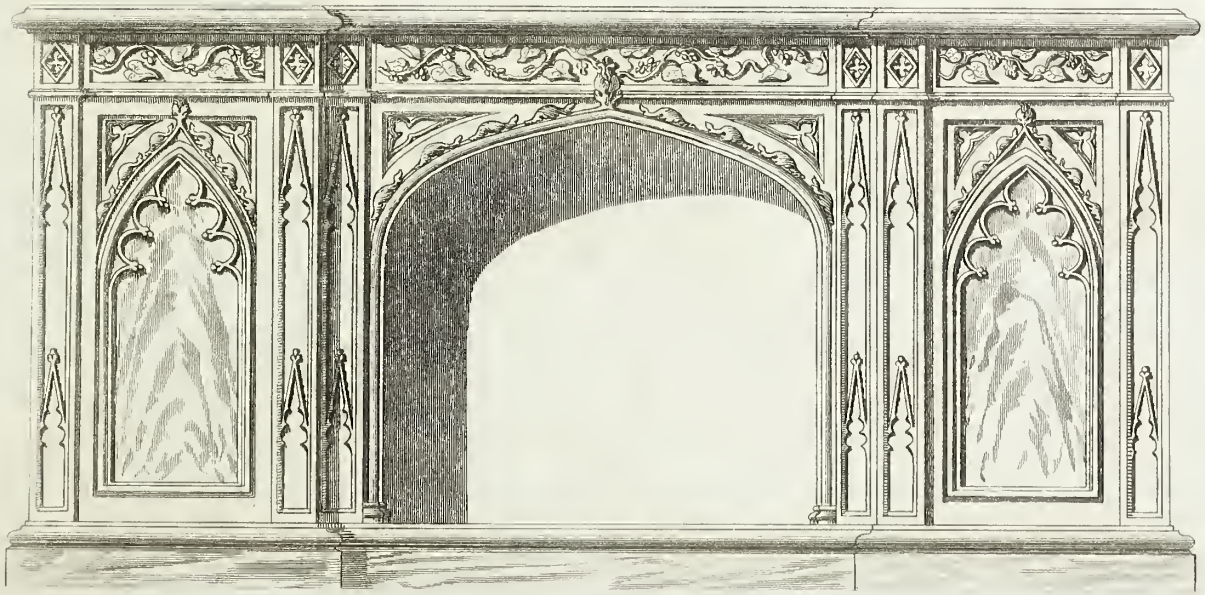


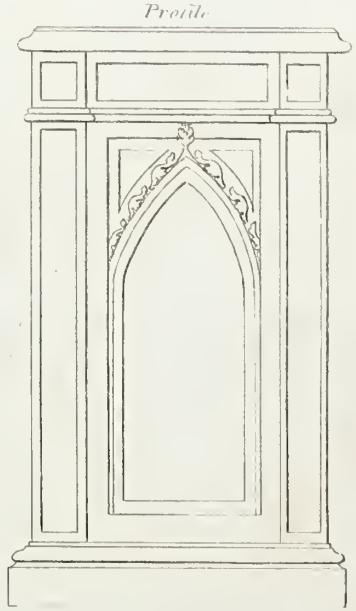


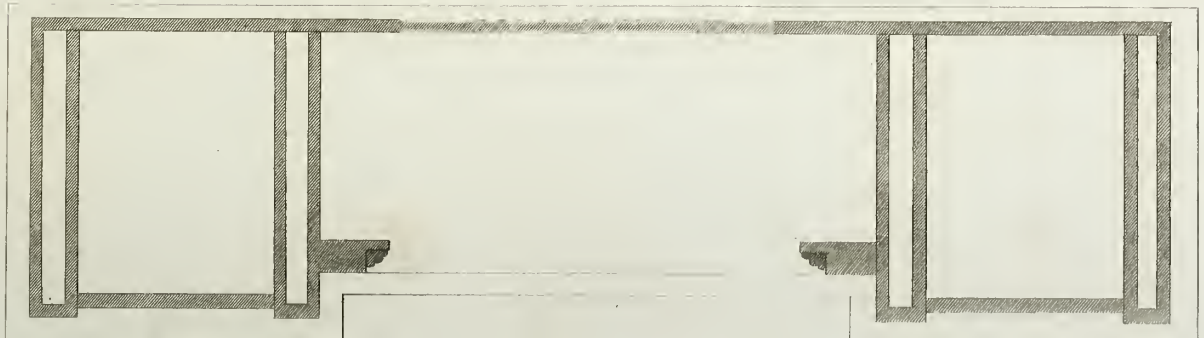
Fat. 3 2 1 0

London ... & Co. Jan. 27, 1827

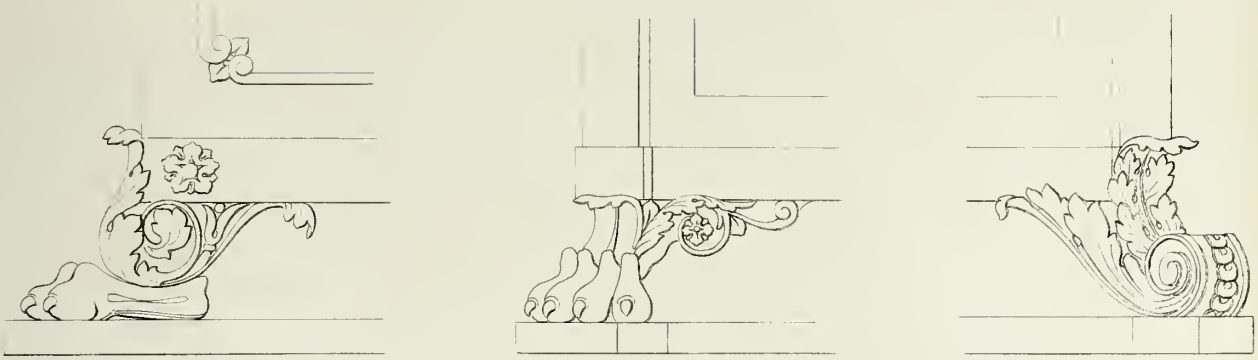
DRAWING ROOM GOTHIC COMMODE.

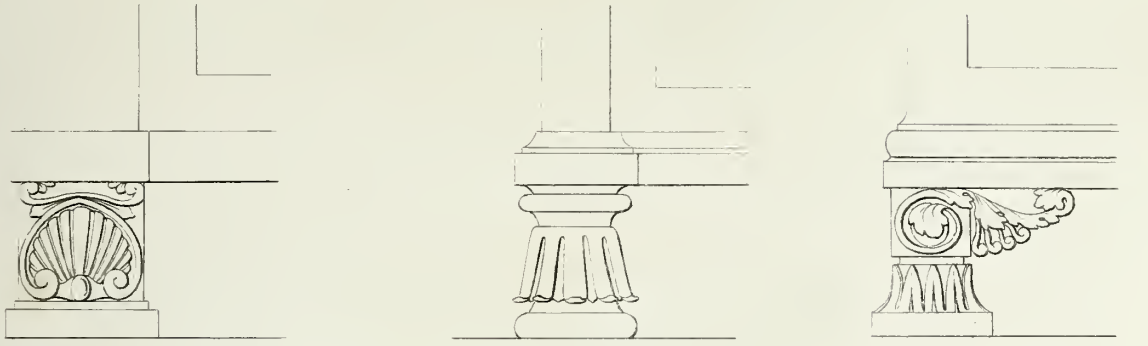


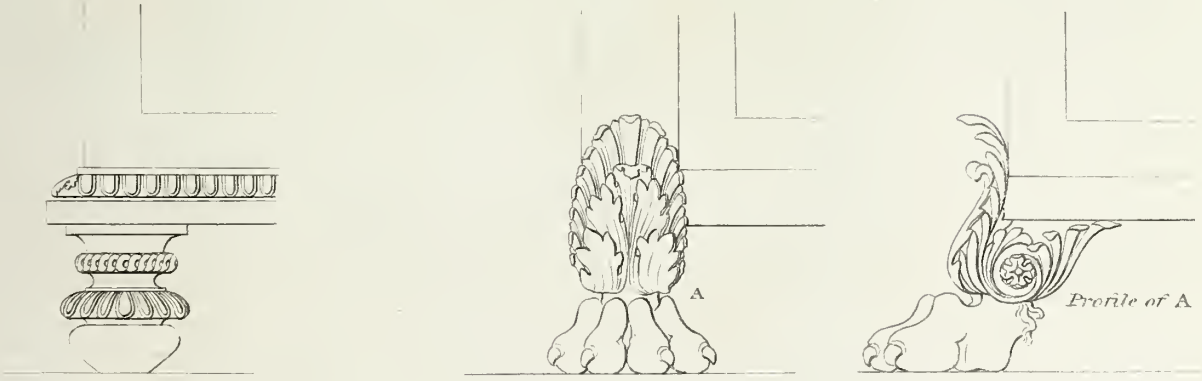




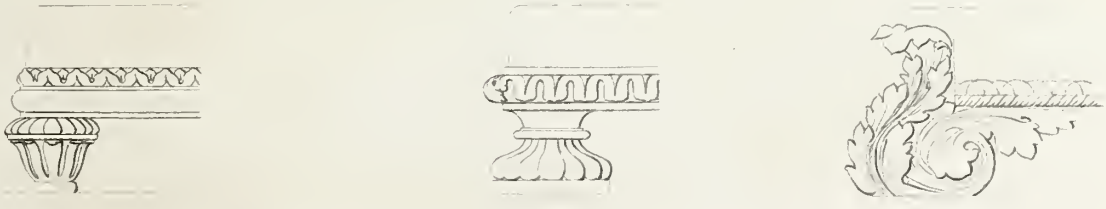
SUPPORTING FEET FOR CABINETS, COMMODES & FOOTSTOOLS.







Footstools.



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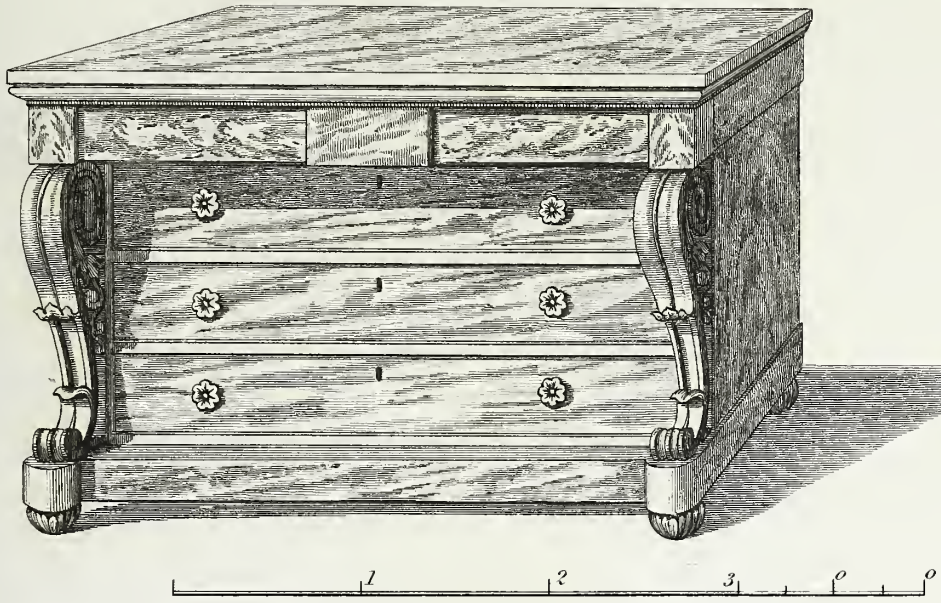
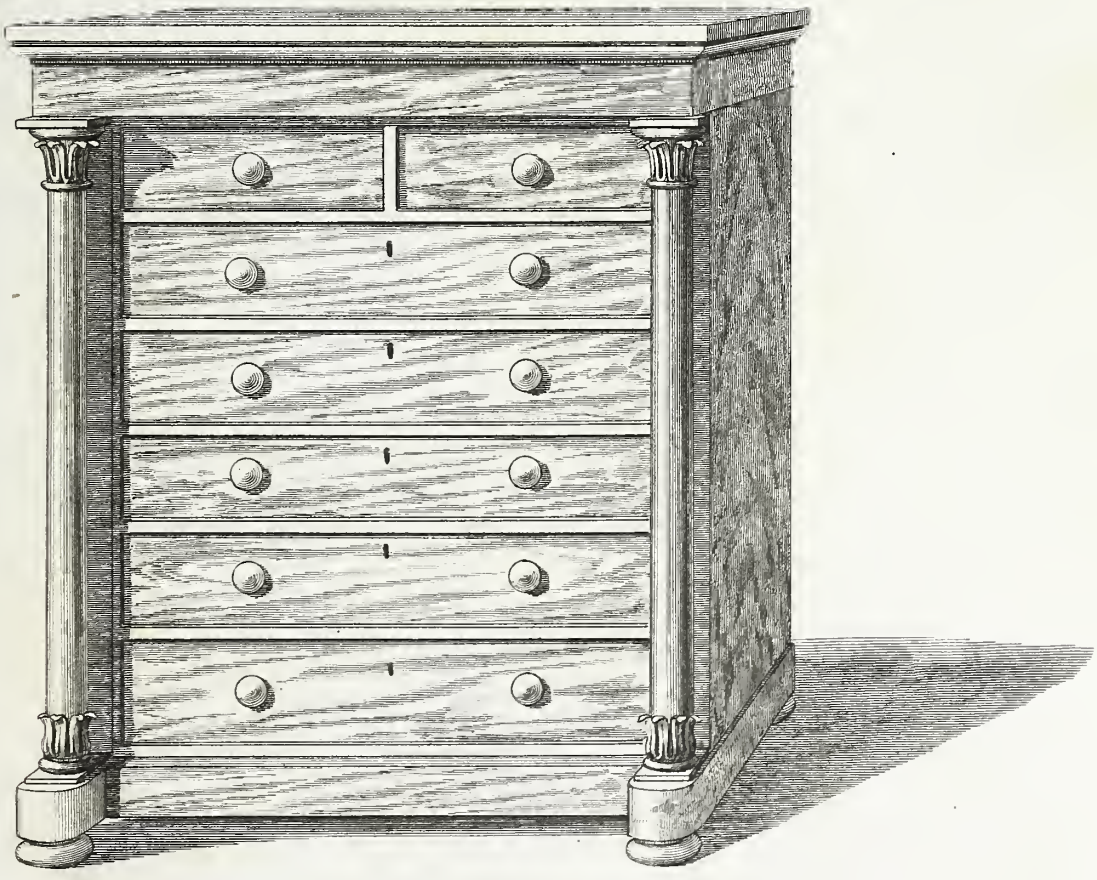
DRESSING ROOM COMMODES.





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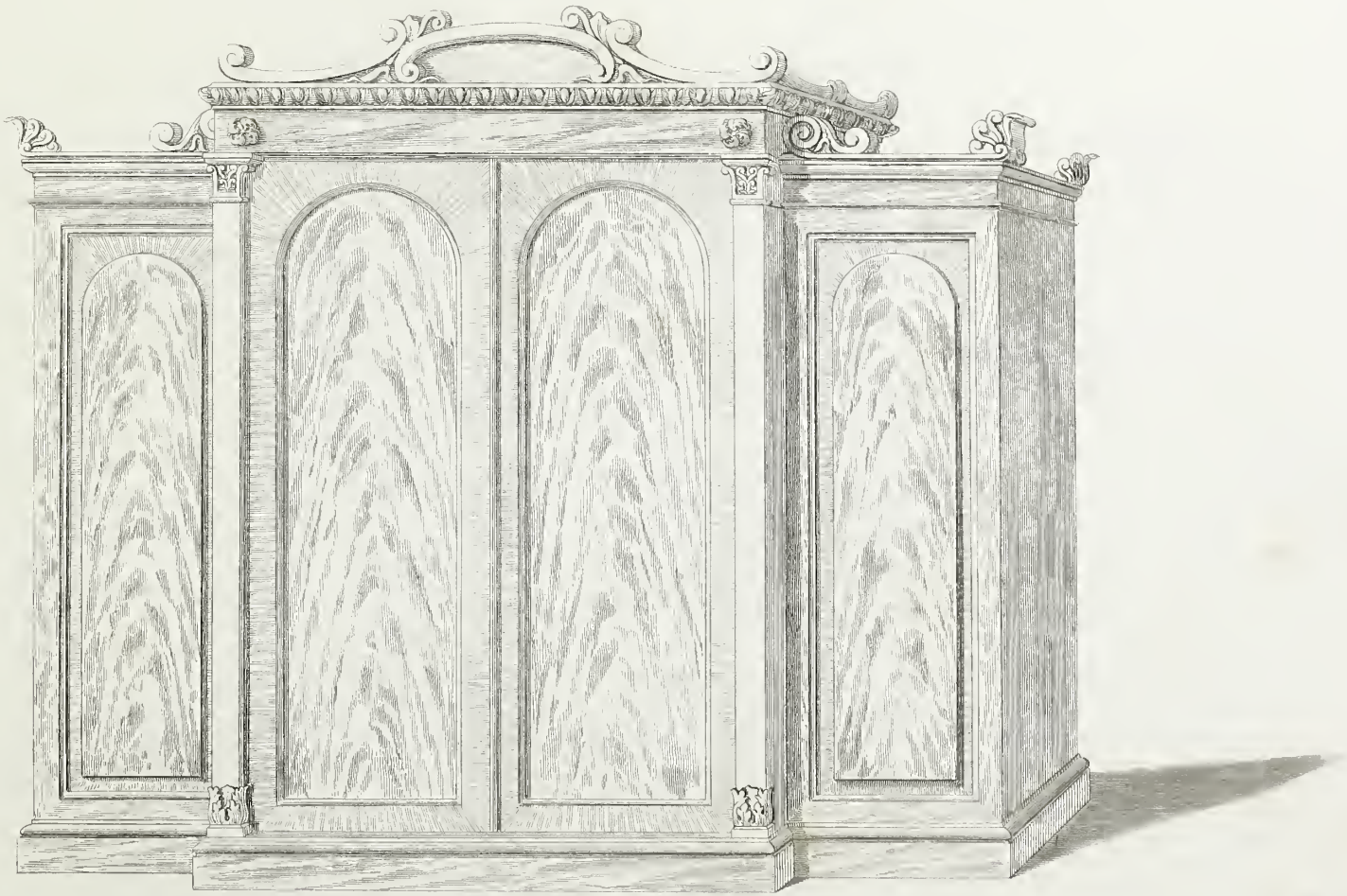
DRAWING ROOM CUPBOARD.

LADIES DWARF WARDROBE.



½ the Depth.

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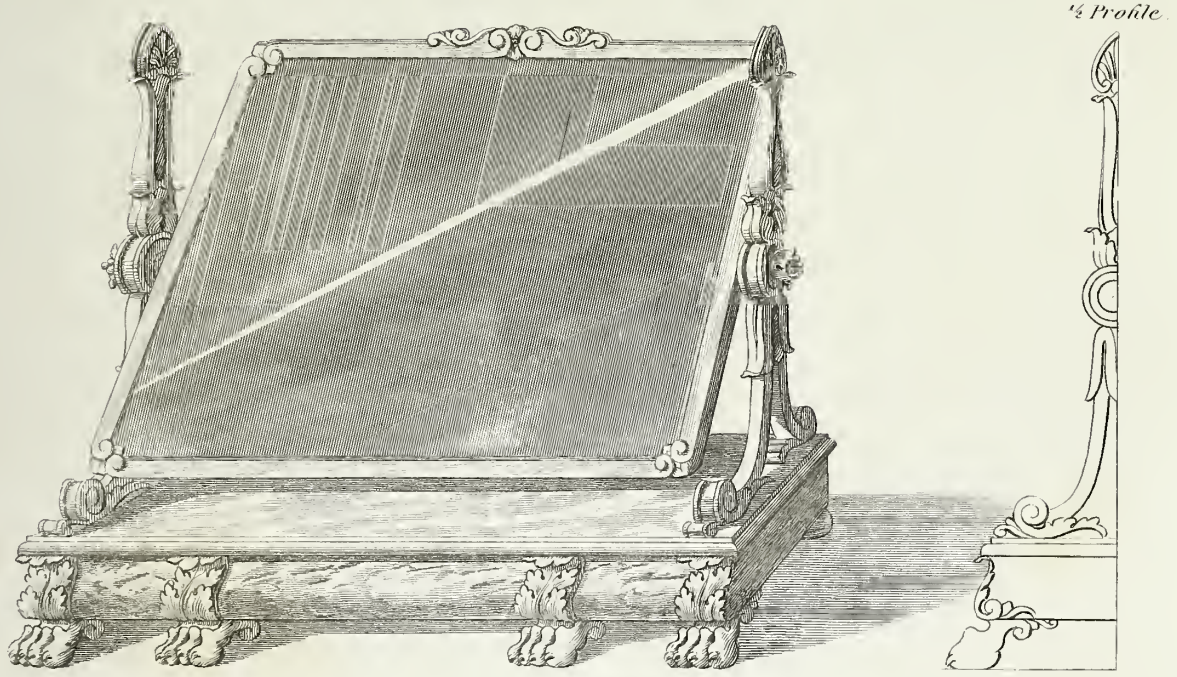

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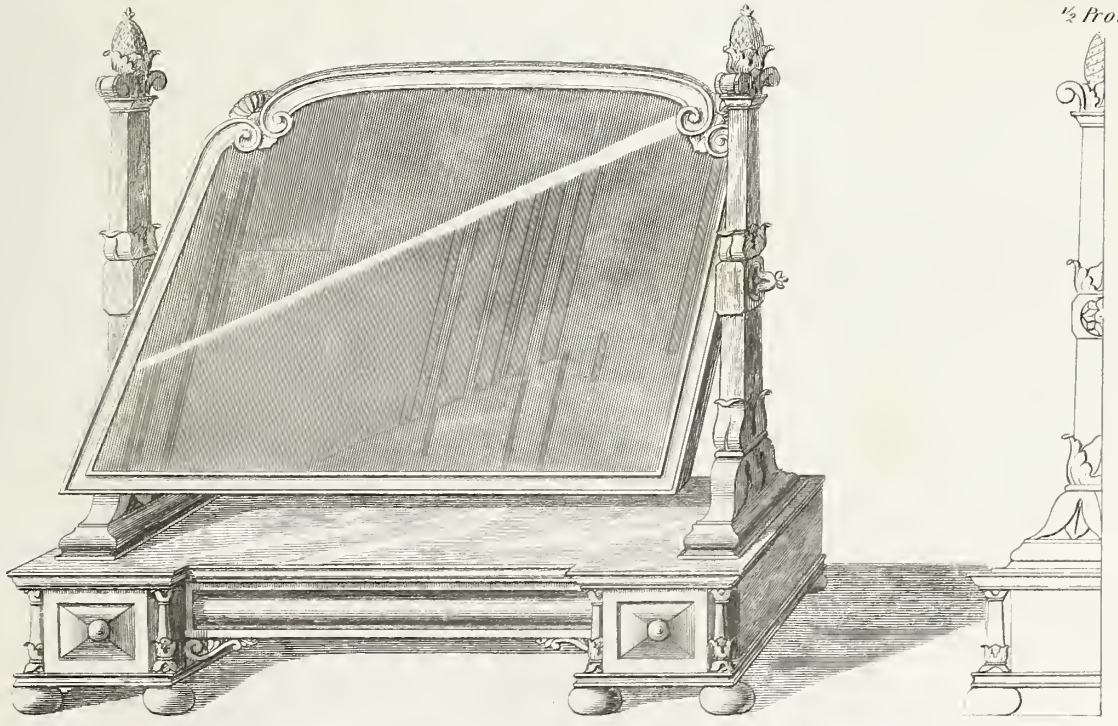

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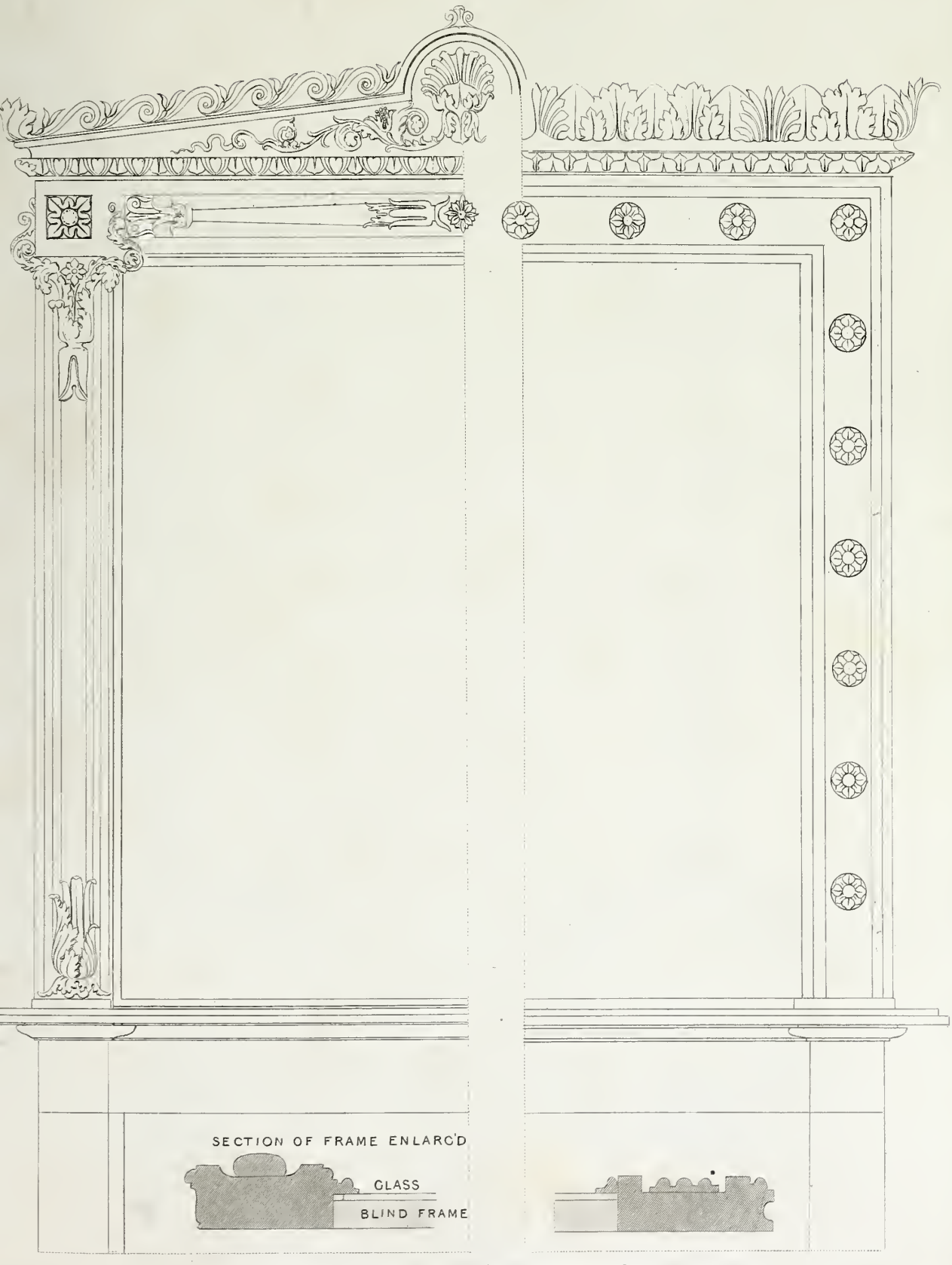
DRAWING. ROOM. CHIMNEY. GLASSES.



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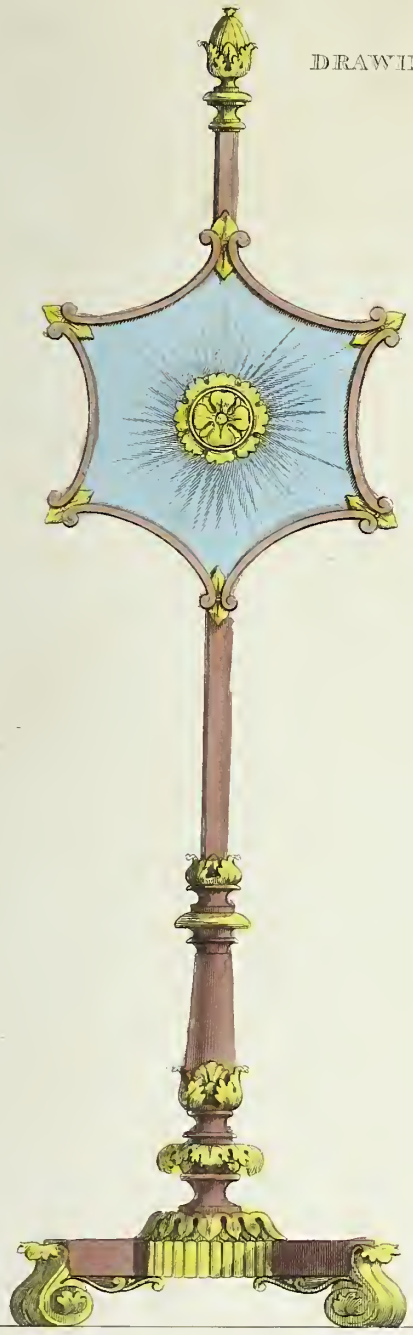

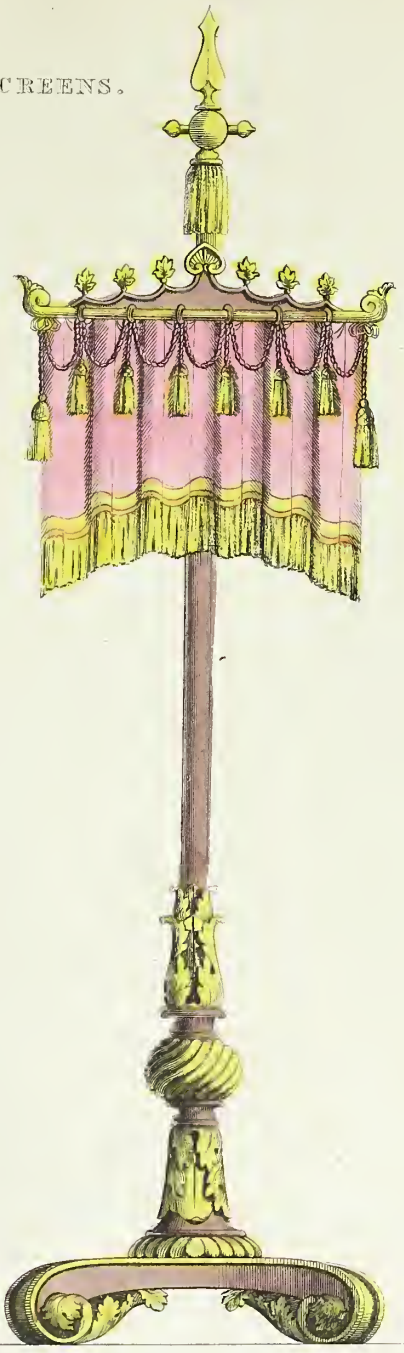

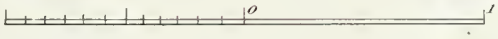

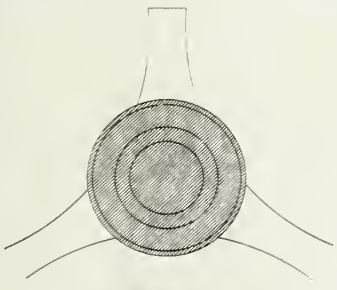

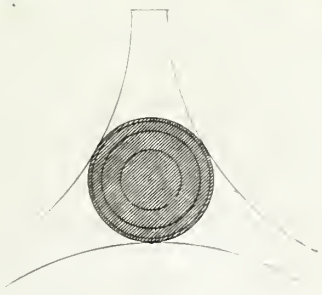

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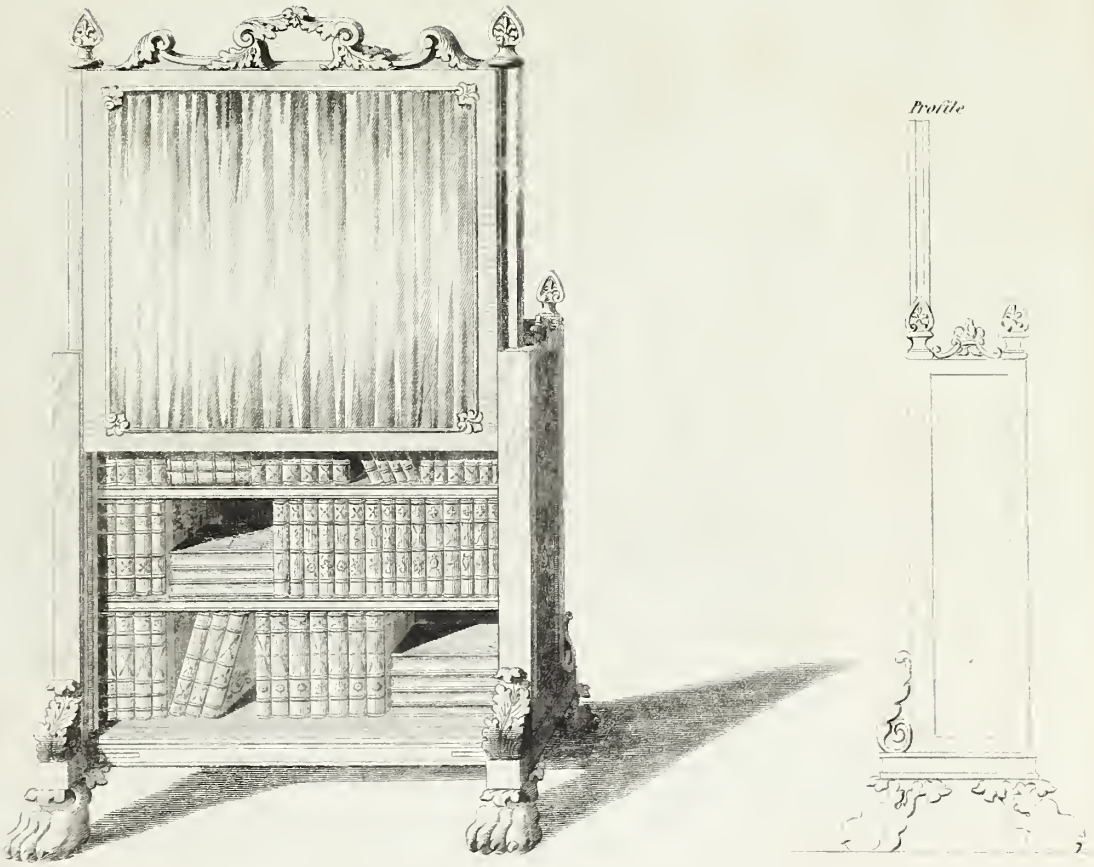

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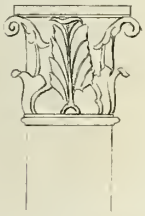

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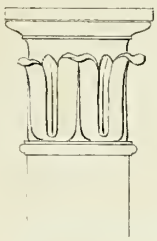


ORNAMENT. ON DOOR.

ORNAMENT. ON. CORNER OF DOORS.

MOLDING AT C

MOLDING OF CORNICE AT A & B

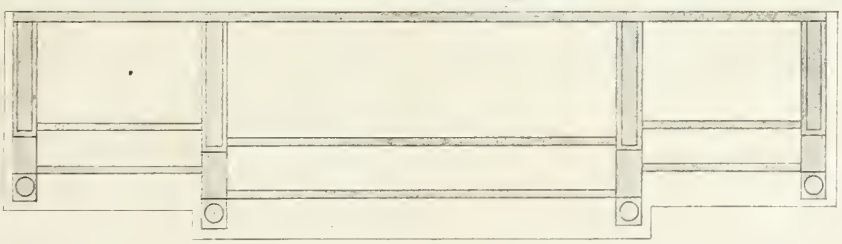
OF PLINTH D

B

A

C

D



SCALE 1 2 3 4 5 FEET

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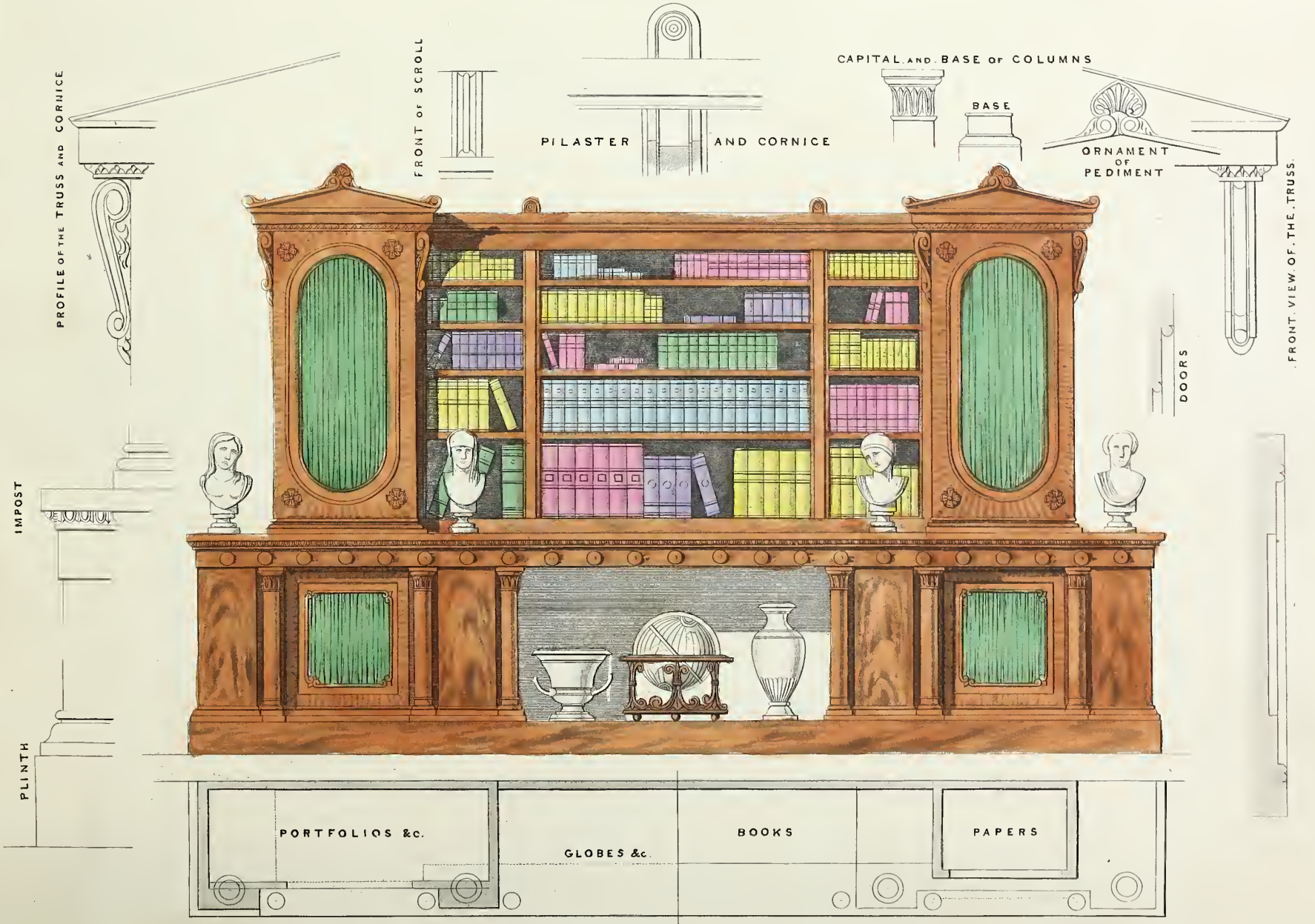

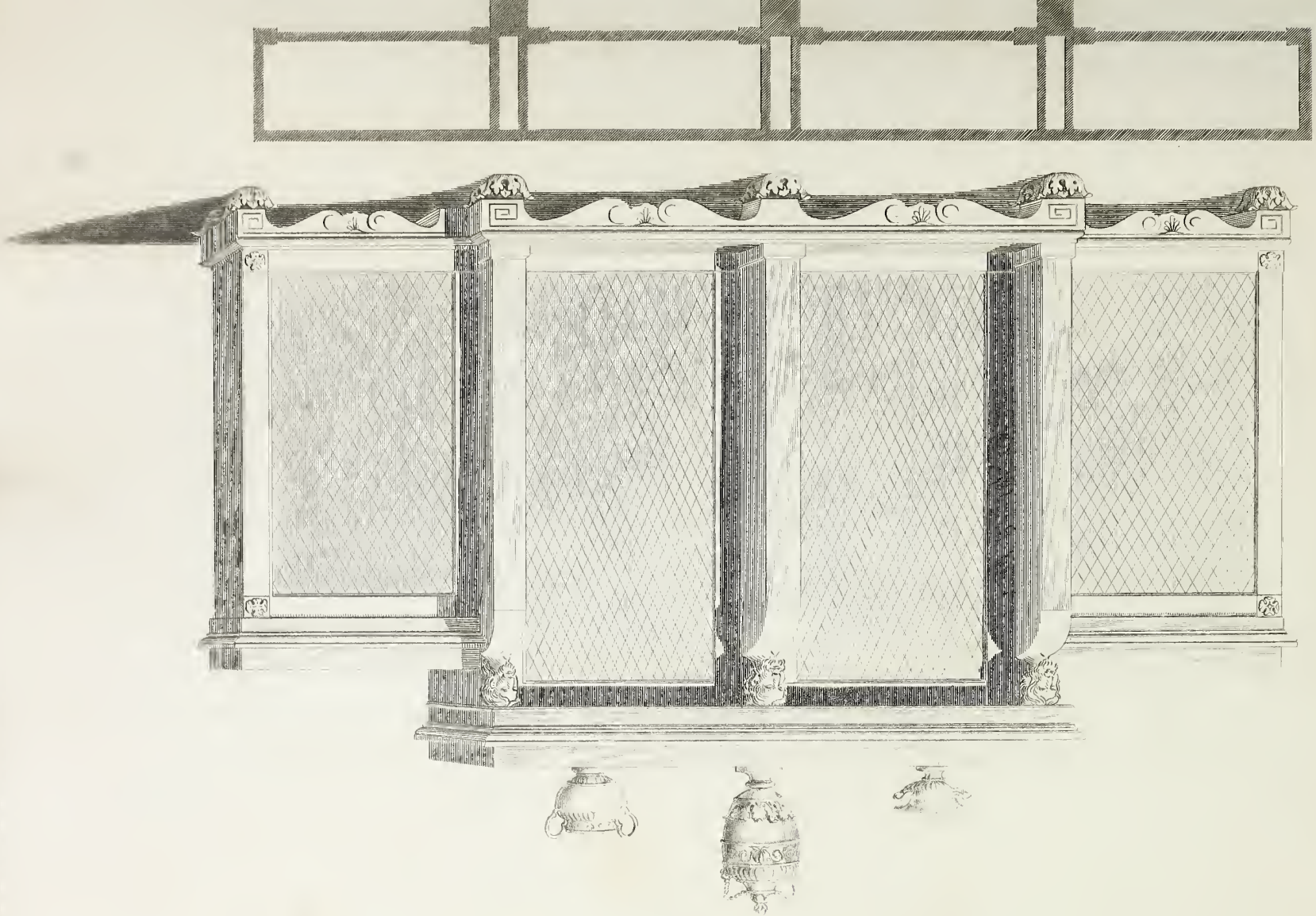

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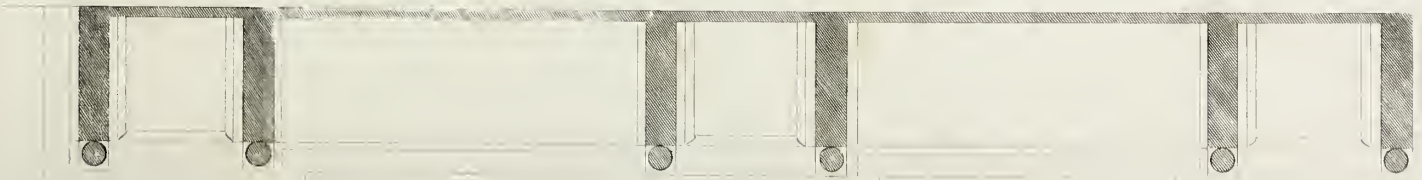

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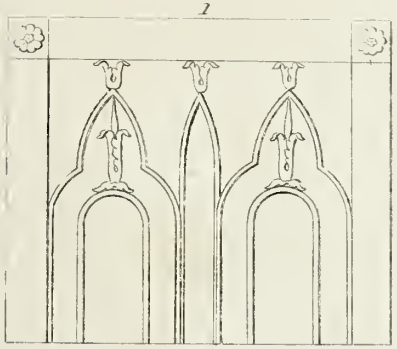
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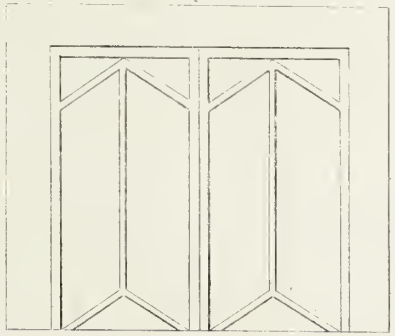
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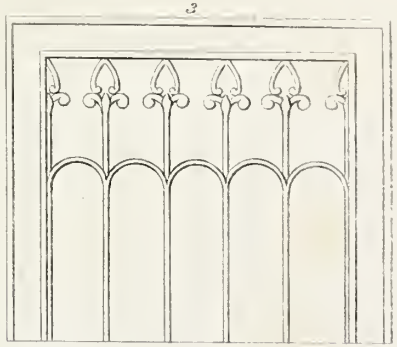
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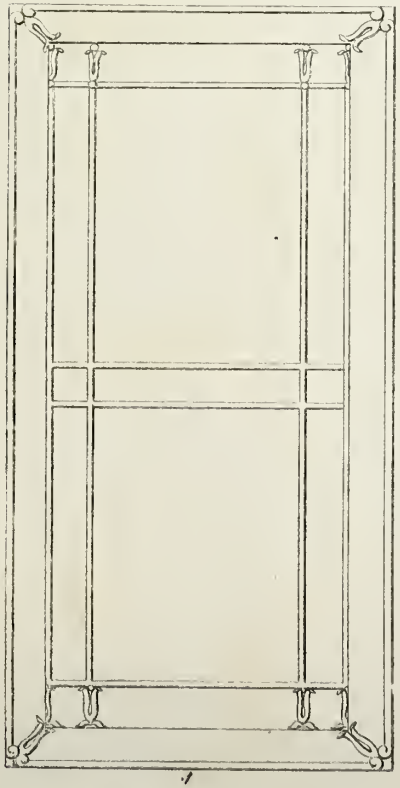
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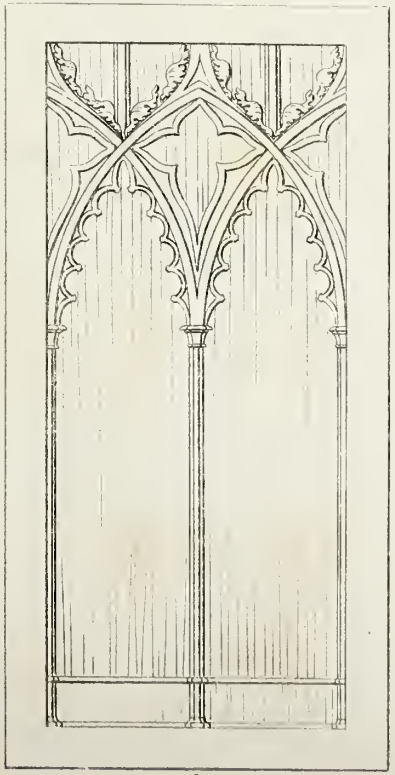
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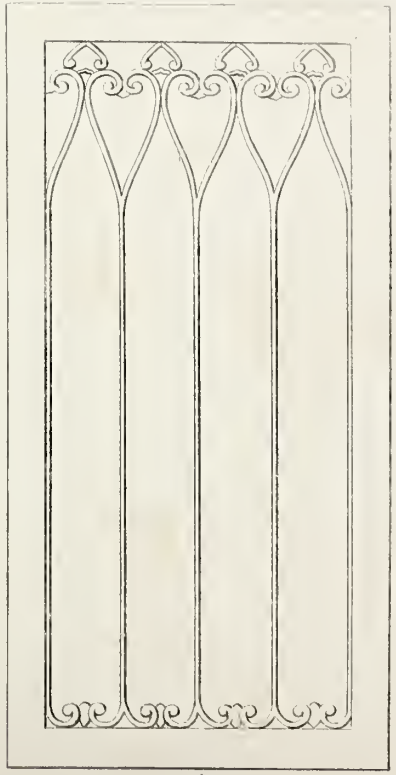
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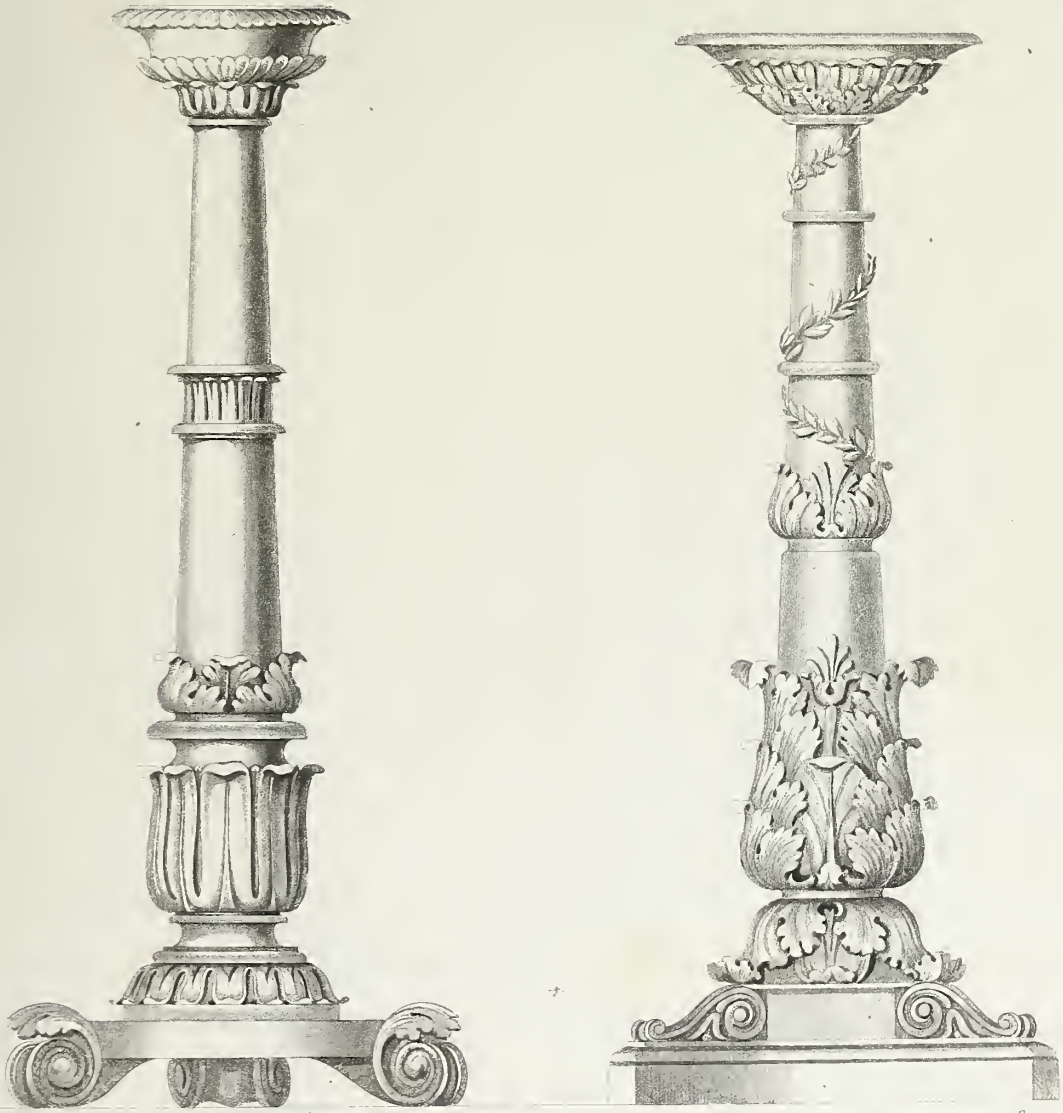

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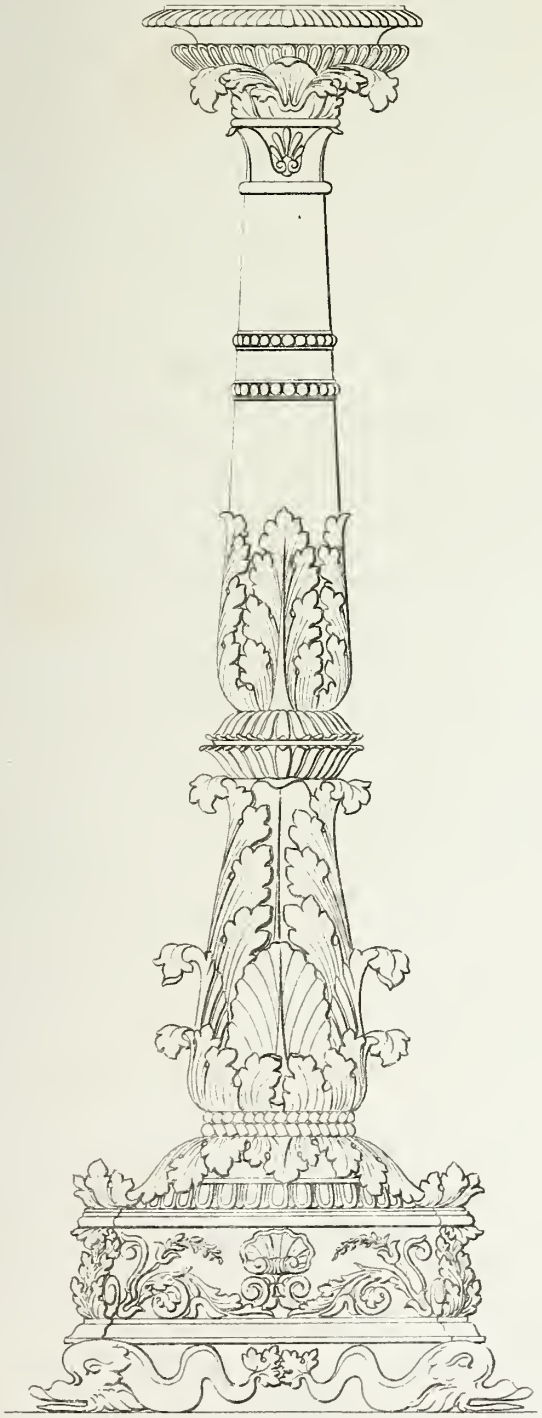

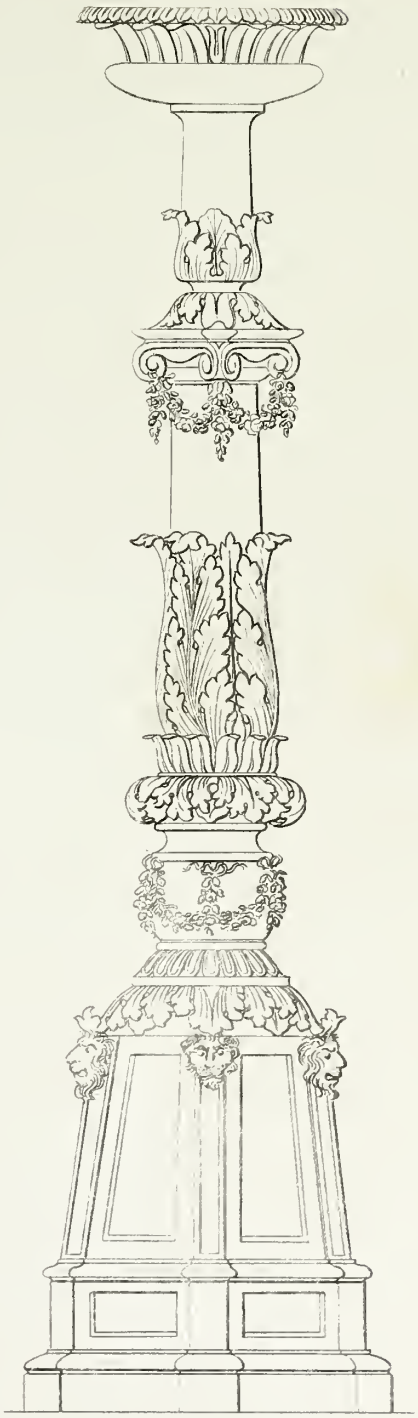

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CANDELABRA FOR COMMODES, PIER TABLES &c.

JARDINIERE AND AVIARY.

A PLAN OF MARBLE VASE FOR BIRDS.

B B PLAN OF AVIARY

C HALF THE PLAN OF JARDINIERE

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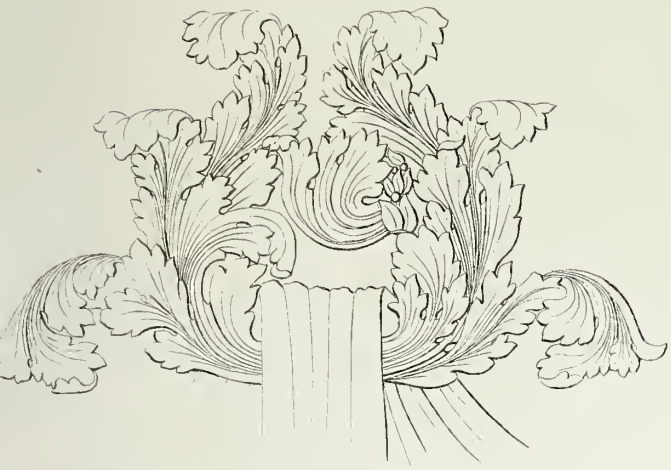
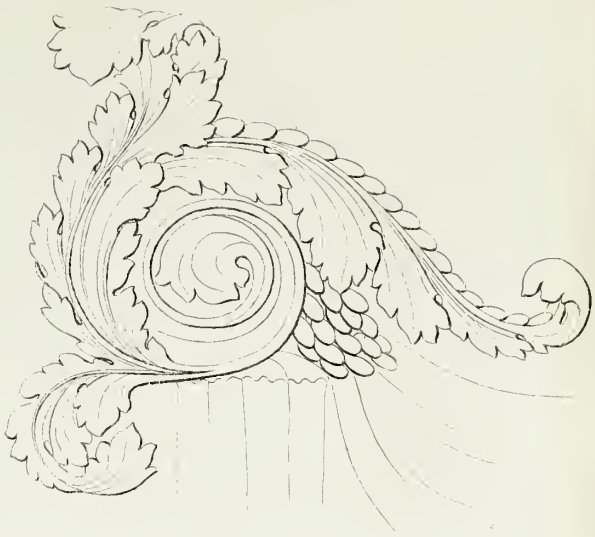
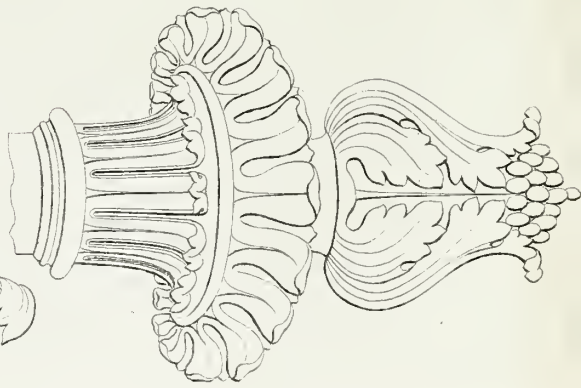
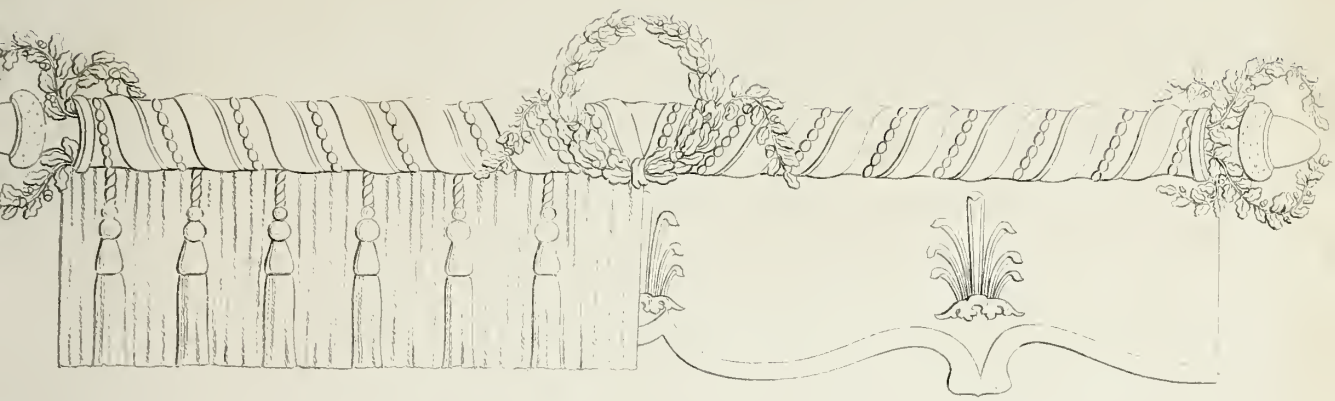
WINDOW CORNICE, CENTERS AND ENDS.

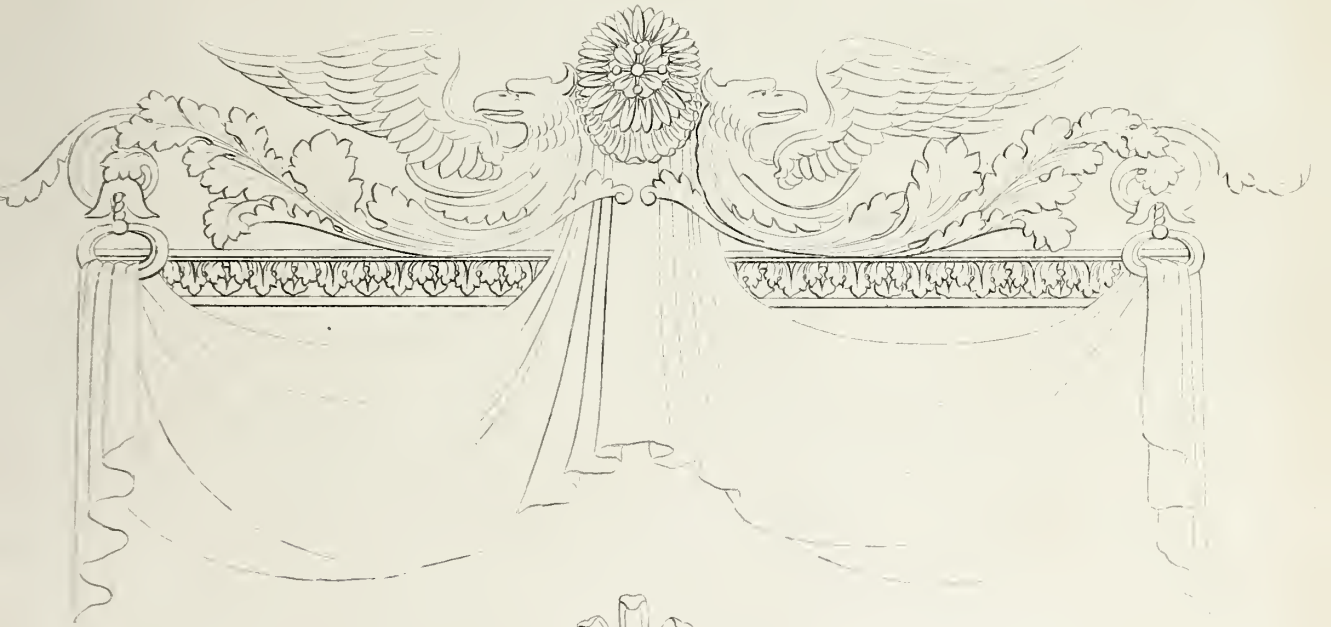






WINDOW CORNICES.





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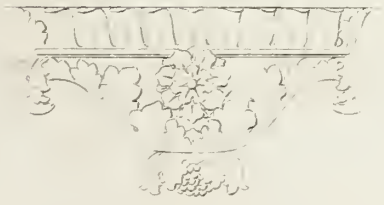
ORNAMENTAL BRACKETS FOR VASES, CLOCKS &c.



Chair, to draw the same perspectively, with its side parallel to the picture, 113. To represent the same in perspective, with its front to the picture, and the method for finding the vanishing points for the bevelled sides, 101.

Chairs of various kinds described, 186—188.

Chaise longue, to represent the same in parallel perspective, 105.

Cheval glass, process for obtaining its perspective representation, 114. Mode for finding the inclination of the swing frame perspectively, 115. Diagrams for elucidating the same, after three different methods 116—117.

Chords, scale of, explained, 57. Its construction laid down, 57. Its application and use, 58.

Chords, line of, on the sector, its use explained, 57.

Chiffonier commode, to draw the same in parallel perspective, with the method for representing a door open, 97.

Circle, division of, 6. Process laid down for dividing the circumference, 7. Its use for laying down angles, explained, 7. To find the centre of a circle from an arc given, 24. To describe the arc of a circle which shall pass through three given points, 24. To divide the circle into three parts for the triangle, 27. Into five parts for the pentagon, 28. Into six parts for the hexagon, 29. To draw the perspective representation of the circle, 79, 80.

Circumference of a circle, to find a right line, whose length shall equal it, 20. The application and use of the problem explained, 20.

Circumference of the ellipsis, defined, 11.

lours, tints in all their varieties produced by the mixture of the primitives, one with the other, 157. A list of the different tints, with the process laid down for producing them, 158—160. Process for laying them on, detailed, 161.

Columns, process for shadowing of, detailed, 149.

Compasses, for dividing, described, 55. Compasses with shifting legs and points, 55.

Compasses, proportional, their use explained, 59, 60.

Cone, definitions of its various sections, 33, 34. Problem for describing the parabola, 34, 35. Problem for describing the hyperbola, 35.

Cone of *rays,* defined, 73.

Console or truss bracket, to find the outline of the same by means of proportional numbers, 52, 53.

Corner ornaments for interior decoration, described, 165.

Cube, to represent the same in parallel perspective, 85. To represent the same with a projecting top, 86.

Cylindrical solid, to represent the same perspectively, 86. The application of the diagram, 87. How to throw out a projecting member from a round object, 89.

Cyma recta, to find the centre for describing it, 38. To describe the same by means of ordinates, 41.

Cyma reversa, rule for describing it by means of ordinates, 41.

Decoration, interior, observations on its origin, rise and progress amongst the ancients, and its gradual improvement to the present time, 164. Observations on decorative painting, 165. The different styles described, viz.—Egyptian, 168. Greek, 169, Etruscan, 170. Roman, 171. Gothic, 171, 172. French, 173. English 174.

Definitions, geometrical—of points, 1, 2. Of lines, 2—4. Of angles, 5—8 Of triangles, 8, 9.

Of rectangles, 9. Of polygons, 10. Of arcs, 10. Of planes and superfices, 10, 11. Of the elliipsis, 11.

Definitions, perspective—of points, 64, 65. Of lines, 66—69. Of planes, 70, 71.

Diagonal line in geometry, defined, 4.

Diagonal line in perspective, defined, 78.

Diagonal point in perspective, defined, 65. Its use explained, 66.

Diagrams, for elucidating and explaining the diagonal line in perspective, 78. For elucidating the doctrine of inclined planes, 117. For elucidating the principles of angular and parallel perspective, pointing out the distinction between the two branches, 119. For elucidating and explaining the laws of reflected light, and the means by which it is conveyed to adjacent objects, 142.

Diameter, of an ellipsis, transverse and conjugate, defined, 11.

Directing point in perspective, defined, 65.

——— *plane* in perspective, defined, 70.

Distance, point of, in perspective, defined, 65.

——— , *points of*, in angular perspective, process for laying them down, detailed, 121.

———, *of the picture*, explained and illustrated, 73—76.

Dividing point in perspective, defined, 65.

Division of the circle, process laid down, 6.

Dome, elliptical, to find the outline or curve for the ribs of, 49.

Drapery, principles laid down for shadowing the folds of, 153.

Draught, ichnographic, or plan, defined, 11. Orthographic draught or elevation, 12. Scenographic draught or perspective representation, 12.

Drawing board, its construction described and explained, 127. Directions for laying down the paper, 126.

Drawing, ornamental, preliminary observations on, 128. The principles laid down and illustrated by various examples, 131—140.

Echinus molding parabolic, method for describing it, 39. Method for describing it of the elliptic form, 40.

Egyptian decoration, observations on, and the style described, 168.

Elbow chair, to represent the same perspectively, 103—105.

Ellipsis, definitions of, 11. Problems for describing it, 32. Problem for finding the foci, 32.

English decoration, observations on the present style, 174.

Equilateral triangle, definition of, 8. Problem for constructing it, 17.

Etruscan decoration, observations on the specimens lately discovered in the excavations at Pompeii, 170.

Extent, point of, defined, 2.

External angle, in geometry, defined, 5.

Face molding, of a raking pediment, rule laid down for finding the mitre, 50. Rule for finding the mitre for the face mold of a circular pediment, 51.

Feet, scale of, described, 55. Its construction laid down, 56.

Figures, definitions of the various kinds in geometry, 9, 10.

Figures, polygonal, problems for contracting the various kinds, 28—31.
———, geometrical, rules laid down for forming the outlines of moldings; vases of various shapes; fretts, guilloche borders, &c. 37—54.
Flight of bed-steps, to represent the same in parallel perspective, 103—105.
Foci of an ellipsis, rule for finding them, 32.
Foliage ornament, instructions for drawing of, 131—140. Rules laid down for the shadowing of, 154—156.
Four post bedstead, to represent the same in inclined perspective, 121.
Frett, Greek, manner of forming it, 42.
Furniture, observations on its origin, progress, &c. i.—viii. Rules laid down for the casting of shadows, with examples, 150—153.
———, *upholstery,* observations on, with descriptions of the various designs introduced, 175—190. Observations on the cabinet branch, &c. 190.

Geometry, definitions in, 1—12. Problems illustrating the practical part, 12—36. Its use in facilitating the knowledge of perspective pointed out, 125.
Geometrical figures, rules laid down for the formation of various kinds, 37—54.
Globe, manner of forming the shape of the gores for its covering, 48.
Gothic arch, rule for finding the centres for describing it, 36.
——— *decoration,* preliminary remarks on the style, 171.
Greek decoration, the style described, 169.
Ground or base line in perspective, defined, 66.
——— *plane* in perspective, defined, 70.
Guilloche, Italian, different modes laid down for forming it, 43.

Hexagon, to inscribe the same in a circle, 29. To represent the same in parallel perspective, 81. Method of finding the vanishing points for the inclined sides, 81.
Hexagons in perspective, to represent a floor of, 82.
Horizon; the rational, sensible and visible, defined, explained and illustrated, 67—68.
Horizontal points, defined and their use explained, 2.
——— *line* in geometry explained, 4.
——— *line* in perspective defined, and its use explained, 69.
——— *line,* observations for determining the height of, 74.
——— *plane,* defined, 70.
Hyperbola, manner of describing it from the cone, 35.
Hypothenuse, of a right-angled triangle defined, 8.

Ichnography, of an object defined, 11.
Incidence, point of, defined, 2.
Inclined line in geometry defined, 3.
Inclined planes, definitions of, 71. Further explained and illustrated, 116—118.
Inclined perspective, preliminary observations on, 118—120. Its principles laid down and demonstrated, 121—123.
Interior decoration, preliminary observations on, 165. The various styles described, 168—174.
Internal angle, defined, 6.

Intersection, point of, defined, 2.
Introduction and prefatory address to the work, I—VIII.
———— to perspective, 61—64.
Isoceles triangle, defined, 9.
Leaves, instructions for drawing the outline of various kinds, 134—137. Instructions for shadowing the same, 154—155.
Level line, in geometry, defined, 4.
Library or writing table, to represent the same in perspective, 91—93.
Library chairs, described, 188.
Light and shade, laws of, considered, 141.
Light, reflected on other bodies, accounted for and explained, 142—143.
Lines in geometry, definitions of, 2—4.
Line of lines, and line of polygons, on the sector, their use explained, 58, 59.
Lines, proportional, nature and theory of, 26. Their use explained and illustrated, 27.
Line, given, problem for bisecting it, 19. Problem for trisecting a given line, 19. The application and use of these problems explained, 19.
Loo table, to find the proportion of a triangular block for the same, 51. To represent a circular loo table with its pillar and triangular block, in perspective, 109—113.

Mathematical point and line, defined, 1—2.
———— *instruments* for drawing, described, 54.
Mixed triangle, defined, 8.
Mixtilineal angle, defined, 5.
Mouldings, rules for describing various kinds, 38—43.

Obtuse angle, defined, 8.
Occasional table, to represent the same in perspective, 107.
Octagon, problems for constructing it, 30. To represent an octagon perspectively, 83. To represent an octangular solid in perspective, 87—90.
Ordinate lines, defined, 4—11. To describe the ellipsis by means of ordinates, 31. To describe the cima recta, and cima reversa by the same means, 41.
Ornamental drawing, preliminary observations on, 128. Instructions for drawing various kinds of simple outlines, 131. For drawing various compound forms, 132—134. Principles of ornamental composition, 139.
Orthographic projection, defined, 12.
Ovolo molding, to find a centre for describing it, 38.

Parallel lines, defined, 4. To draw one line parallel to another, 21. The application and use of the problem, 22.
Parallel ruler, description and use of, 22.
Parallelogram, defined, 9.
Parobola, to describe the same from the cone, 34.
Pateras, ornamental, instructions for drawing various kinds of, 138.
Pavement of squares in perspective, mode of representing the same, 77,

Pediment, to find the outline of the face mold for the raking and circular, 50, 51.
Pentagon, to inscribe the same in a circle, 28.
Periphery of an ellipsis, defined, 11.
Perpendicular line, defined, 3. To let fall a line from a given point that shall be perpendicular to another line, 12. The application and use of the problem explained, 12. To erect a perpendicular on a given line, 13. To raise a perpendicular at the end of a line, 13. To raise a perpendicular by means of a scale, 14.
Perspective, general introduction, 61—64. Applied to furniture drawing, 73. The difference between parallel and inclined perspective explained, 119.
Picture, observations on the position and distance of, 73.
Physical line, defined, 3.
Pilasters, their application in interior decoration, 166.
Plan, in drawing or design explained, 11.
Planes and *superfices* in geometry, defined, 10, 11.
Planes in perspective, definitions of, 70.
Points in geometry, definitions of the various, 1, 2. Definitions of the various points made use of in perspective, 64—66.
Polygons, line of, on the sector, its use explained, 59.
Polygonal figures, defined, 10.
Prism, octagonal, to represent the same perspectively, 90.
Projection of shadows applied to furniture, observations on, and rules laid down, 144—153
Proportional compasses, description and use of, 59.
Protractor, description and use of, 55.
Pyramid of rays, defined, 72.

Rational horizon, defined, 67.
Rays visual in perspective, defined, 72.
Rectangle in geometry, defined, 9,
Reflection and refraction of light, explained and illustrated, 141—143.
Rhombus and rhomboid, defined, 9
Right angle, defined, 5—7.
Right angled triangle, defined, 8.
Ribs of an elliptical dome, to find the curve or outline, 49.
Roman decoration, the style described, 171.

Scale of feet and inches described, 55. Its construction and use, 56. The construction and use of the scale of tenths, 56. The construction and use of the scale of chords on the sector, 57.
Scalene triangle, defined, 8.
Scenographic draught, defined, 12.
Scotia Greek, rule for describing it, 39. Rule for describing the Roman, 39.
Secretaire desk and bookcase, to represent the same in perspective, 94.
Sensible and rational horizons, coincidence between the two, shown and illustrated, 67.

Shadows, rules for projecting them, 145. Instructions for shadowing of drapery, 153. Shadowing of leaves, 154. Shadowing of foliage ornament, 155.
Sideboard, rules for proportioning, the top, the moulding, and under rail, 54.
Sight, point of, in perspective, defined, 64.
Sofa, to represent the same perspectively, 105.
Solids, cylindrical, and octagonal, to represent the same perspectively, 86—89.
Square in geometry, defined, 9.
Square in geometry, problems for constructing it, 18. Their application, 18, 19.
Square, bevelled, its construction and use, 22, 127.
Square of octagons, to represent the same in perspective, 84. To find the perspective representation of squares, placed at different distances from each other, 78. To represent a geometrical square perspectively, 76.
Station point, defined, 2.
Station line in perspective, defined, 69.

Table top, to find the proportion of the width, the length being given, 27.
Table, for a library, to represent the same perspectively, 91—93. To represent an occasional table in perspective, 107—109. To represent a circular loo table in perspective, 109—113.
Tenths, scale of, its construction, and use, 56.
Transverse diameter of an ellipsis, defined, 11.
Trapezium, defined, 10.
Triangle, equilateral, problem for constructing it, 17. To make one triangle equal to another, 17. To inscribe a triangle in a circle, 27. To represent a triangle perspectively, 72.
Triangular block for a loo table, to find the proportion of the same, 51.
Triangles, definitions of, 8.
Truss support, mode of finding the outline by numbers, 52—54.

Vanishing points in perspective, defined, 65.
Vanishing lines, defined, 69.
Vanishing point for an inclined plane, rule for finding the same, 117. To find the vanishing points for an object inclined to the picture, 121.
Vase, geometrical rules for finding the outline of the Greek or the Etruscan, 44—46. Rule for finding the outline of the Roman vase according to Serlio, 46.
Vertical line, defined, 69.
Vertical plane, nature of, defined, 71.
Visible horizon, explained, 67.
Visual rays in perspective, defined and their nature explained, 72.
View, central, of an object, best adapted for some cases, 113.

DIRECTIONS TO THE BINDER FOR PLACING THE PLATES.

GEOMETRY.

Plate 1, to face page 2
2, VII. 4
3, XLIV. 5
4, XLV. 6
5, XLVI. 8
6, XLVII. 10
7, XLVIII. 11
8, 49. 13
9, 50. 15
10, 51. 18
11, 52. 22
12, 53. 26
13, 54. 32

GEOMETRICAL FIGURES.

Plate 1, XXV. 37
2, XL. 42
2, LXV. 44
3, LVII. 48
4, LVI. 51
LVIII. 55

PERSPECTIVE.

Plate A, LXXXVII. 65
B, LXXXVIII. 66
C, LXXVIII. 71
D, LXXIX. 75
Plate 1, XXX. 76
2, LXXXIX. 79
3, LXXVI. 81
4, LXXVII. 83
5, LXXXII. 85
6, LXXI. 92
7, LXXXIV. 94
8, XCI. 97
9, XVI. 100
10, CXX. 103
11, CXIV. 105
12, CIII. 108
13, CXII. 110
14, CV. 114
15, CXVI. 121

ORNAMENTAL DRAWING.

Plate CX. 131
CXI. 133
XX. 134
CXXI. 136
XXI. 138
CXXII. 140

SHADOWING.

Plate CXXIII. 144
CXXIV. 150
CXXV. 153
CXXVI. 154
C. 156
CVI. 156
XIV. 156

COLOURING.

Plate CXXVII. 158

INTERIOR DECORATION.

Plates XXVIII. CXXXIII. LXXXV. LXXXVI. XXXIX. } to follow p. 166.
Plates CXLVII. CXLVIII. CXLIX. CL. CLI. CLII. CLIII. } to follow p. 174.

WINDOW CURTAINS.

Plates H. XXXIII. XXXVII. CXLIV. XCV. XCVI. CXXIX. XII. XIX. CXI. XI. CXLI. LXXIII.

BEDS.

Plates V. LXX. CXVII. CXXX. XLIII. XCVII. CXIII. XIII. LX.

CHAIRS AND SOFAS.

Plates III. CXLVI. CXLIII. LXVIII. XXXII. CIX. XXXVIII. CXXXVII. LXXXI. XCIV. X. CXXVI. IX. CIV. LXXIV. CXXXI.

TABLES.

Plates XXIV. CXVIII. XLII. XXVII. LXIV. LXXXIII. VIII. XXVI. XXXVI. LIX. CXXVI. CXXXII. CXXXIX. XXXV. CIX.

SIDEBOARDS.

Plates XCIX. IV. LXXV. LXVI. LXIII. XVII. XXIX. LV. CVII.

COMMODES.

Plates LXXX. VI. CII. LXIX. LXXII. LXII.

WARDROBES.

Plates XC. CVIII. XXXI.

DRESSING GLASSES.

Plate CI.

CHIMNEY GLASSES.

Plate XV.

FIRE SCREENS.

Plate LXI.

SCREEN LIBRAIRE.

Plate CXXXVIII.

BOOKCASES.

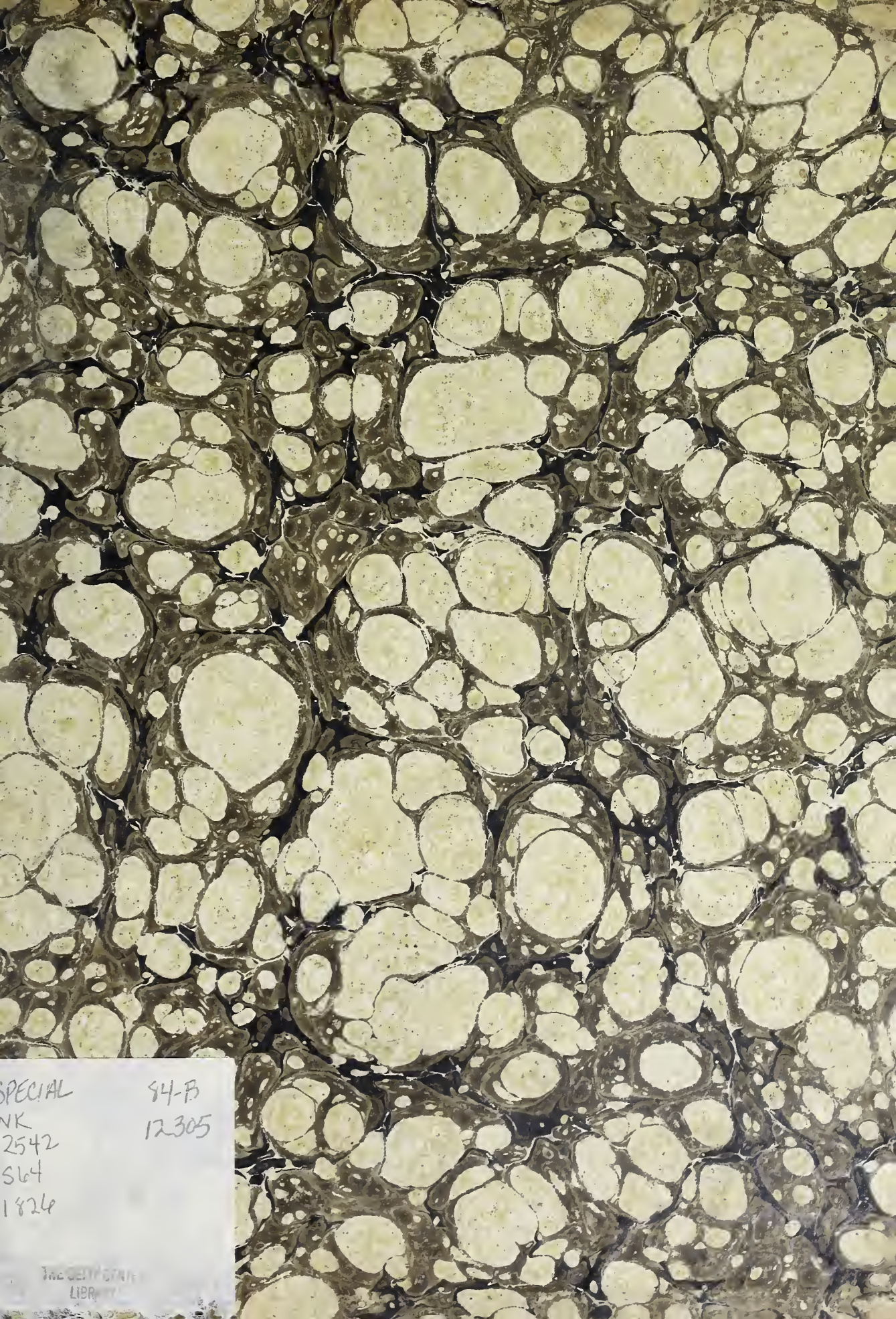
Plates XXIII. XLI XCVIII. CXLII. XCIII.

CANDELABRA, &c.

Plates XVIII. CXV. CXXXIV. XXII. LXVII. XCII. CXXXV.

To be placed at the end of the book.

Plate CXLV. To be placed opposite the engraved Title, at the beginning of the book.



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